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Ontario

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 206

DATE: Monday, May 28, 1990

BEFORE:

A. KOVEN, Chairman

E. MARTEL, Member



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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the
Honourable Jim Bradley, Minister of the
Environment, requiring the Environmental
Assessment Board to hold a hearing with
respect to a Class Environmental
Assessment (No. NR-AA-30) of an
undertaking by the Ministry of Natural
Resources for the activity of timber
management on Crown Lands in Ontario.

Hearing held at the offices of the Ontario
Highway Transport Commission, Britannica
Building, 151 Bloor Street West, 10th Floor,
Toronto, Ontario, on Monday, May
28th, 1990, commencing at 10:00 a.m.

VOLUME 206

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	
MS. C. BLASTORAH)	MINISTRY OF NATURAL
MS. K. MURPHY)	RESOURCES
MR. B. CAMPBELL)	
MS. J. SEABORN)	MINISTRY OF ENVIRONMENT
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MR. P.R. CASSIDY)	ASSOCIATION
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MR. R. BARNES)	ASSOCIATION
MR. R. EDWARDS)	NORTHERN ONTARIO TOURIST
MR. B. McKERCHER)	OUTFITTERS ASSOCIATION

APPEARANCES: (Cont'd)

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MS. B. LLOYD)	
MR. J.W. ERICKSON, Q.C.)		RED LAKE-EAR FALLS JOINT
MR. B. BABCOCK)	MUNICIPAL COMMITTEE
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MR. G.J. KINLIN		DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC		MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES		ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI		BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY

APPEARANCES: (Cont'd)

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MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

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1 ---Upon commencing at 10:17 a.m.

2 MADAM CHAIR: Good morning, ladies and
3 gentlemen. Please be seated.

4 Good morning, Ms. Cronk.

5 I think we will start now, it is about 20
6 after 10, and we will go until noon and have our
7 regular noon break from 12:00 until 1:30.

8 MS. CRONK: Thank you. Good morning
9 Madam Chair, Mr. Martel.

10
11 MAXWELL McCORMACK,
12 RODERICK CARROW,
13 ROBERT TOMCHICK,
14 WILLIAM SMITH,
MURRAY FERGUSON,
PHILIP BUNCE,
GEORGE STANCLIK, Recalled

15 CONTINUED DIRECT EXAMINATION BY MS. CRONK:

16 Q. Dr. McCormack, when we met last day
17 you were in the course of reviewing a number of slides
18 for the Board with respect to a number of the issues
19 that you had dealt with in your evidence.

20 And before you turn to the balance of
21 those, there is one issue that I would invite you to
22 return to, if I could put it that way. During the
23 course of your evidence last day, you indicated,
24 according to the transcript on a number of occasions,
25 that if herbicides are applied by aerial methods as

1 opposed to ground application methods, less quantity of
2 chemical is required under the aerial method. Do you
3 recall that, sir?

4 DR. McCORMACK: A. Yes, I do.

5 Q. Based on my review of the transcript
6 since we last met before the Board, the reasons for
7 that are not perfectly clear, at least to me.

8 Could I ask you why that is the case, in
9 your opinion?

10 DR. McCORMACK: A. Well, it's a long
11 established principle in spraying herbicides on target
12 vegetation that aerial application is more efficient,
13 and a manager can achieve an equivalent level of
14 suppression or better level of suppression with less
15 herbicide use from the air as compared to ground
16 application because the aerial application provides a
17 more consistent, uniform, well distributed spray
18 pattern with droplets which are of smaller average size
19 which allows the equivalent amount of herbicides to be
20 more thoroughly distributed across the target
21 vegetation.

22 So, in effect, more of the active
23 ingredient actually reaches the target and is better
24 distributed across the target.

25 Also, the aerial application provides

1 -better precision in placing the spray pattern on the
2 target vegetation and, at the same time, the target
3 vegetation is not disturbed or disrupted in any manner
4 because of the need for personnel or equipment to move
5 through the target vegetation. So there is less
6 disturbance and there is better, in effect,
7 accessibility for the delivery system to reach the
8 target vegetation and disturbance, I mentioned, is a
9 factor.

10 The other thing that enters in here when
11 we look at the ground application option is larger
12 droplet sizes are required, and since the point from
13 which the herbicide is delivered, the applicator is at
14 a disadvantage because you are at the level of the
15 target or, in some case, slightly below it, so you are
16 directing in the spray pattern laterally or something
17 approaching a lateral delivery which puts the equipment
18 at a disadvantage in covering with a good distribution
19 of the herbicide the target vegetation.

20 Another consideration is the
21 concentrations of the spray mixture. An active
22 ingredient like glyphosate especially works best when
23 it is at a slightly higher concentration in the spray
24 droplet. And when you can consider ground application
25 requires a much higher total volume to deliver a given

1 amount of herbicide, you lose some efficacy because
2 there is a lower concentration of the active ingredient
3 in the individual spray droplet when this is delivered
4 from the ground.

5 Those are the reasons that come to mind.

6 Q. Thank you, Dr. McCormack. Could I
7 ask you now, if you would, please, to turn to the
8 balance of the slides that you were going through when
9 we broke last day, and I understand that a number of
10 the slides which you are now going to be showing to the
11 Board deal with work that was undertaken with respect
12 to something that's called the Austin Pond study?

13 A. Yes, that's correct.

14 Q. Could you outline for the Board,
15 please, what that is and what it involves?

16 A. All the remaining slides in fact view
17 the Austin Pond study site from different vantage
18 points and, as well, different points in time, from the
19 day it have sprayed until some 11 years or so after the
20 treatment was applied. This study site is described
21 briefly in the Brouse paper which is Exhibit 722, that
22 relates to effects of herbicide release on browse.
23 That exhibit does describe the study site.

24 This study site is also the basis for
25 some of the growth response data which are included in

1 our statement of evidence and it's unique for the study
2 site, especially valuable for the several reasons, and
3 I don't want to get into a detailed description of what
4 it takes to establish such a study, but when you must
5 individually mix 10 to 12 different herbicide
6 treatments, rinsing the equipment in-between, put them
7 in a helicopter and then make sure you spray them
8 evenly across did designated treatment blocks, and then
9 you try and do it all in one spray session, which means
10 the weather must cooperate, as well as the equipment.

11 This happens in my work maybe once every
12 three to five years, that this kind of success can be
13 achieved. That provides a more valuable study site
14 that if it must be broken up over several days or even
15 if part of it must be sprayed in the morning or in the
16 evening.

17 Q. Where is Austin Pond?

18 A. Austin Pond is in Bald Mountain
19 Township, which is approximately 20 miles northeast of
20 Bingham Maine. It's in the Katabak River Valley in
21 northcentral Maine.

22 Q. Did you have any involvement yourself
23 in the various studies conducted at that site?

24 A. I have been involved in every study
25 or scientific study which has taken place on the site.

1 I established the study, I established the treatment
2 blocks before treatment and supervised all the mixing
3 and spraying of the treatments.

4 Q. And when did the studies of this site
5 commence?

6 A. The treatment blocks were evaluated
7 and marked during midsummer of 1977 and all the
8 treatments were applied in the morning on the 4th of
9 August, 1977. It was an excellent set of weather
10 conditions that morning.

11 So, if I may, I will elaborate a bit on
12 these blocks because this is also important.

13 We survey all the vegetation across a
14 single clearcut so that the treatment blocks could be
15 established as plots on vegetation conditions which
16 were comparable. So that if we surveyed the
17 post-harvesting and it was seven years after harvest,
18 the vegetation conditions there, and found conditions
19 which were not comparable to other portions of the
20 clearcut, we rejected those so that all the treatments
21 were applied to blocks that had similar vegetation
22 conditions. This was also a fortuitous set of
23 conditions in conducting such a study.

24 So that we have a set of replicated
25 blocks which are all comparable because of their

1 similarity as surveyed prior to treatment and then all
2 the treatments were applied the same morning under
3 exactly the same conditions.

4 That is one of the reasons why we have
5 spent so much time measuring on this study site, is
6 because it provides us one of the most sound sets of
7 data which are available to us at this time.

8 Q. What was the purpose of the study?

9 A. The purpose of the study was to do
10 some early efficacy testing on what we thought would be
11 two new herbicides. This study site was in fact the
12 first aerial application of glyphosate in eastern North
13 America.

14 And at the time, because of small plot
15 work, we were trying to convince Monsanto to consider a
16 forestry release label for the product. They, at that
17 time, did not fully appreciate the capability of the
18 active ingredient within our forest system and we did
19 the same thing with triclopyr which has become, in the
20 United States, the herbicide Garlon and will be the
21 herbicide known as Release Silvicultural Herbicide in
22 Canada. This was the first aerial application of that
23 material in eastern North America, as well.

24 We were comparing these -- we were
25 testing their efficacy and we were comparing these with

1 the treatments that had been the practice of the day.
2 At this time 2,4,5-T and 2,4-D were still available, so
3 we were able to put these down side by side for
4 comparison.

5 That also provides an opportunity and it
6 is one of the few studies where the new chemistry,
7 glyphosate and triclopyr, are side by side with the old
8 herbicides, 2,4-D and 2,4,5-T, so that we are able to
9 compare and project the relative efficacies as we look
10 at new treatments as they might compare or do compare
11 to treatments that are carried out in the past. So
12 that's another value this thing.

13 Q. Is there anything else by way of
14 introductory information that you feel, that you wish
15 to point out to the Board before you show the slides
16 with respect to the Austin Pond studies?

17 A. The study site also was selected
18 because it had almost all the species that we wanted to
19 study present, all the principal competing vegetation
20 species that were a problem for the forest industry in
21 Maine and many of these are the same competing species
22 in the area of the undertaking, as well as a nice
23 distribution of natural regeneration of spruces, balsam
24 fir and white pine.

25 Though it was on the brink of being

1 ... suppressed, the crop trees were on the brink of being
2 suppressed to the point that another two or three years
3 the release would have been too late, but with all of
4 the vegetation present we had an unusual opportunity to
5 study a wide array of species as well.

6 Q. What type of competitor species were
7 present on the site?

8 A. These are also summarized in the
9 exhibit I mentioned earlier, trembling aspen, the
10 occasional big tooth aspen, white birch, red maple,
11 alder, raspberry, pin cherry and then the occasional
12 other woody shrubs, yellow birch on occasion, not very
13 much, and occasionally beech.

14 Q. Thank you. And what slides are you
15 going to commence with for the assistance of the Board?

16 A. I will resume with the slide which is
17 No. 22 on the list which -- on the list of slides that
18 follows that note in the middle of the third page.

19 MS. CRONK: Madam Chair, you will recall
20 that list is part of Exhibit 1135.

21 DR. McCORMACK: I think it would help if
22 somebody can get these other lights, especially this
23 one here (indicating)

24 MS. CRONK: I can say, Madam Chair, for
25 your assistance as well, you have been provided with

1 hard copies in photograph form of the slides. That's
2 Exhibit 1134 and Tab B taken from Dr. McCormack's
3 evidence.

4 DR. McCORMACK: So this is slide No. 22.
5 It shows --

6 MS. CRONK: Excuse me, Dr. McCormack,
7 just one moment.

8 MR. MARTEL: Can we just one wait one
9 moment, please.

10 MR. CRONK: If it would be of assistance
11 I can provide you with an extra copy of that exhibit.

12 MR. MARTEL: Either that or just the
13 list.

14 MS. CRONK: I would be glad to provide
15 it, sir. (handed)

16 MR. MARTEL: Thank you.

17 MS. CRONK: You are welcome.

18 DR. McCORMACK: This is No. 22. This is
19 the day of application in August 1977 and here in the
20 centre of the photo you can actually see the helicopter
21 spraying, here to the left you can see the marking of
22 one of the boundary blocks.

23 These boundaries were also live flagged,
24 meaning people with flags waving them to mark the line
25 to assist the pilot in flying. My technician flew as

1 a spotter with the pilot to make sure the treatments
2 went down on the blocks where they had been randomly
3 assigned. My procedure, once the helicopter was up and
4 flying, when I could access the block, would be to get
5 one of these boundaries and run out into the block
6 while it was being sprayed so that I could watch the
7 spray pattern coming down and observe the exact
8 conditions on the block while the treatment was being
9 put in place.

10 You can see here aspen, birch, maple, an
11 indication of the level of competing vegetation which
12 was present. It was definitely getting late for
13 efficient treatment, but, as I think you will see as I
14 proceed, we did get in there in time.

15 Moving on to No. 23 which is an aerial
16 view of some of the blocks one year after treatment and
17 in this picture several things can be observed. One,
18 in the centre of the photo is a control or untreated
19 block and you can see that the rectangle is well
20 defined, though those treatments went down with
21 conventional spray equipment of the day which was what
22 came off potato fields where they're spraying.

23 You can see the well-defined blocks.
24 Each treatment block was roughly one hectare in size,
25 actually 2.6 acres, and along the road front in this

1 photograph you can see an untreated edge, a block here
2 with a slight green colour to it, this was a triclopyr
3 treatment. Triclopyr has a different spectrum of
4 control as compared to glyphosate which accounts for
5 the light green colour, as the vegetation which
6 remained. It was not controlled by triclopyr, but was
7 controlled by glyphosate which was the treatment next
8 in line.

9 Q. Sorry, Dr. McCormack, for the record,
10 with respect to the triclopyr treated area you are
11 referring to the left of the photograph?

12 A. The left, I am going from left to
13 right along the road front. There is a small corner of
14 an untreated. The first block coming in from the left
15 with the greenish colour to it is triclopyr, then we
16 have a glyphosate treated block, then the one I
17 referred to early is untreated block.

18 Another glyphosate treated block at the
19 lower rate of glyphosate, and I will be able to show
20 you a ground photograph in the interior of this block
21 roughly two weeks, I believe, I will have to check the
22 date, but the same general time period of this
23 photograph.

24 As we proceed to the right and almost up
25 to the right edge of the photo is a portion of a block

1 here which was treated with a lower rate of 2,4,5-T.
2 There are other block treatments here, but for
3 reference it's easier to describe those on the road
4 front. So in year one, it is possible to see some of
5 the relative differences across the treatments.

6 Moving on to No. 24. That doesn't look
7 too clear to me from here. Is that visible from
8 directly in front?

9 MADAM CHAIR: It is dark but we can see
10 it, Dr. McCormack.

11 DR. McCORMACK: Same day, coming around
12 in a circle, looking back in the other direction at the
13 same block. So over here is the -- going from right to
14 left, the triclopyr, the glyphosate, the untreated,
15 control, glyphosate and furthest left, treated block,
16 2,4,5-T, at a rate of two pounds active ingredient per
17 acre and here 2,4,5-T at three pounds active
18 ingredient.

19 Here we can see the other blocks, but I
20 will only direct your attention here to the lower right
21 centre, a narrow strip of trees which are visible.
22 This is where the pilot missed a bit in matching up his
23 swaths and that narrow strip there is where the swaths
24 did not match up one to the other in what was a
25 glyphosate treatment. That row of trees will be seen

1 later as well.

2 I show you this one because this view is
3 similar to the next slide which take place later. So
4 if you can envision this sequence of treatments, this
5 is an early spring shot. This is No. 25 taken on the
6 26th of April. A similar view, but a little further
7 black, six years after treatment. This is the edge, to
8 the right, of the untreated forest, the edge of the
9 study site. This block was that original triclopyr
10 block I made reference to, then the glyphosate block.
11 This patch here is the untreated control block.
12 (indicating)

13 MS. CRONK: Q. You are pointing to the
14 middle of the photograph?

15 DR. McCORMACK: A. It's pretty much in
16 the centre. This is the same control block with butts
17 up against the road that runs across the photograph.
18 Keep in mind here that in April the hardwood brush has
19 not yet leafed out. Consequently, we see the skeleton
20 of that brush and not the green.

21 Directing your attention just below that
22 block is a well-defined line of taller and hardwood
23 trees. That's that skip between the swaths that I made
24 reference to earlier, which also shows how well-defined
25 the spray pattern was.

1 You can see what has happened here in
2 terms of stocking of spruce, fir regeneration and you
3 can see with the different blocks the different
4 treatment, but this also illustrate the definite
5 benefit of gains and stocking of crop trees treated
6 versus control versus treated and they are side by
7 side.

8 This comes in a little closer, the same
9 view. Going from right to left, triclopyr, glyphosate,
10 untreated control, glyphosate, way off on the left edge
11 of the photograph 2,4,5-T. Here again is that line of
12 trees that resulted from the two swaths not being
13 directly side to side.

14 This is No. 27 taken in March, 1989. It
15 is a longer range aerial view of the same portion of
16 the study site. However, in the meantime we conducted
17 a precommercial thinning operation across half of each
18 treated block in order to superimpose the silvicultural
19 treatment of precommercial thinning.

20 Consequently, you see these lines and you
21 see space trees, as well as unspaced trees, and barely
22 but visible is that block of the grown up brush of the
23 untreated control block and again here we have
24 triclopyr, glyphosate, untreated, glyphosate, 2,4,5-T
25 and so on. And if one looks more broadly at the

1 adjacent forest from where our test treatments went,
2 one can see a fairly well-defined forest as opposed to
3 one which is not well stocked.

4 Q. At what time of year was that
5 photograph taken, Dr. McCormack?

6 A. The date on this was -- I don't have
7 the exact day, but it was in March, 1989, 11 years --
8 this would be 11 growing seasons after treatment.

9 Going on to No. 28, now a series of
10 ground views of the same study site. I mentioned in
11 the aerial view of those often referred to blocks one
12 year after treatment that here is a photograph taken in
13 July '78 in the lower rate of glyphosate. This would
14 be very close to what we would consider to be an
15 operational rate of glyphosate, Roundup or Vision.
16 This is one year after treatment where a few crop trees
17 can be seen and the brush and raspberry which has been
18 suppressed is readily visible. One can still see some
19 leaves on some of the hardwoods and off to the left in
20 the back is the edge of that control block, the
21 untreated block, off on the left edge.

22 So this illustrates what the conditions
23 are for glyphosate, reasonably typical, one year after
24 treatment.

25 A few other views from the ground now to

1 slide No. 28. This is again -- I'm sorry, I'm now
2 at...

3 Q. No. 29.

4 A. No. 29. This shows a combination of
5 triclopyr and 2,4-D as a treatment four years after
6 treatment and we consider this silviculturally
7 effective. There are a few voids in the stocking in
8 this photograph, some of remains of the blush are still
9 visible, but one can see fir and spruce trees clearly
10 in a dominant position, but also see that the other
11 vegetation which was suppressed here, birch, here in
12 the foreground a fair amount of raspberry, I see a
13 maple sprout coming up here on the right. The other
14 vegetation is still present but we have achieved that
15 referred to silvicultural effectiveness by putting the
16 crop trees into a dominant position.

17 Moving on to No. 30. This is four years
18 after treatment on the edge of a triclopyr plus 2,4-D.
19 The edge of the spray swath, to the left, the treated;
20 to the right, the untreated. That clearly shows the
21 difference in the four years following treatment.

22 Here are some crop trees coming into a
23 dominant position, here was a set of maple sprouts that
24 were hardly controlled at all by the treatment and here
25 is pin cherry and other vegetation is visible in the

1 photograph, but the line in the centre clearly shows
2 the difference, left, treated; right, untreated four
3 years after treatment.

4 Now, here is a series of a boundary of a
5 treated on the left and untreated on the right. The
6 man in the photograph with the range pole is standing
7 right about on the edge of the spray swath and these
8 two hardwood stems just slightly to the right in the
9 centre ground will be visible in some of the later
10 photographs. The brush which has been suppressed is
11 visible across the area to the left. One year after
12 treatment, (indicating) same location, a little closer
13 up, three years after treatment. These are the same
14 two hardwood stems that I referred to in the preceding
15 photograph. Untreated on the right, treated on the
16 left.

17 Going back to the same spot four years
18 after treatment in photograph No. 33. One of the
19 hardwood stands fell over. This one is the centre of
20 the photograph remains, untreated on the right, treated
21 on the left.

22 One more photograph of that same point,
23 which was the last year I was able to work on this
24 series because the vegetation grew too tall. Untreated
25 on the right, heavy brush, competing vegetation. I

1 will show you a photograph of the interior of this
2 stand later, and to the left we see vegetation growing
3 back, but we also see crop trees in a dominant
4 position. This one is five years after treatment.

5 Photograph 35 shows some stem
6 cross-sections of spruce and fir four years after
7 treatment. To illustrate the growth response, if we
8 count back 1, 2, 3, 4 on the fir or the same thing, 1,
9 2, 3, 4 on the spruce. You can clear see the radial
10 growth response in the four years following treatment.

11 No. 36 is the first of three photographs,
12 though the first of actually a pair which compares.
13 This is five years after treatment, some photographs
14 taken the 21st of August in 1982.

15 Dr. Newton, who is the gentleman in the
16 photograph, and I spent the better part of the day
17 surveying the blocks, and based on our measurements we
18 went into the control block, which can be seen to the
19 left in the rear, and took as best we could determine
20 of what was left an average spruce tree from the
21 unsprayed and on the right, an average spruce tree from
22 a treated block. Dr. Newton is holding his hands at
23 the point that was the exact height of each of those
24 trees at the time of treatment. So you can see here
25 the response.

1 First I direct your attention to the
2 caliper of the stems reflecting the radial growth
3 response. The vigor or robustness of the treated tree
4 as compared to the untreated tree, the amount of
5 foliage present, the amount of foliage retrained, the
6 colour of the foliage and especially if one looks at
7 the leader now that height growth has been completed in
8 the fifth growing season. The fifth year of height
9 growth of the treated tree as compared to the fifth
10 year of height growth of the untreated tree.

11 Actually as you look at these leaders you
12 can see bumps on the treated tree which reflect the
13 size of the buds as compared to not having visible buds
14 on the untreated tree, and we found over the years that
15 the sizes of buds on the leader, on the short needle
16 conifer is a very good indication of the health and
17 vigor of the tree. The larger the bud, the more
18 healthy is the tree and the more vigorously it would be
19 able to grow in the coming year. So there is the
20 comparison of spruce.

21 Q. How old are those trees, Dr.
22 McCormack?

23 A. They would be -- I would have to
24 carefully age those trees because it's natural
25 regeneration and they started from seed, possibly just

1 prior to harvest, so it would require aging. I have
2 aged other trees on that site and we have determined
3 that the average age of the seedlings which were
4 present at the time of harvesting was approximately
5 eight to ten years. We treated seven years later.
6 These photographs were taken five years after
7 treatment.

8 The years prior to treatment are not
9 totally effective years because the trees were
10 underneath the brush and suppressed and that's why Dr.
11 Newton is holding his hand at the point which was the
12 tip of the tree, the total height of each of those
13 trees at the time of treatment, so that we evaluate
14 them in effect from the time of treatment forward.

15 Going on to No. 37. Acknowledging that
16 balsam fir is more responsive than spruce and generally
17 quite responsive in a positive way to herbicide
18 treatment, though I would add that white spruce is
19 similar in its response, the same comparison with Dr.
20 Newton holding the trees where balsam fir is shown in
21 No. 37. He is again holding his hand at the point
22 which was the top of the tree at the time of treatment,
23 though it's hard to see on the tree on the right.

24 On the left is an average tree from an
25 untreated block and on the right, an average tree from

1 : a herbicide treated block, and personally I don't think
2 this one requires much elaboration. The tree on the
3 right is more than twice as tall, the leader of the
4 fifth year height growth is four to five times the
5 length of the leader of the untreated tree.

6 Q. Were those trees similar or
7 dissimilar in height at the time of treatment, Dr.
8 McCormack?

9 A. Within a matter of a centimeter or
10 two they were exactly the same height. It is hard to
11 see Dr. Newton's hand down here, you can just barely
12 see part of it where I am holding the pointer, and you
13 can see that it's roughly the same height as where his
14 hand is placed on the treated and the untreated one.

15 Q. How many years after treatment was
16 that photograph taken?

17 A. This was five, five years after
18 treatment. This is No. 37.

19 The next photograph is simply a matter of
20 Dr. Newton taking these two trees, dropping them on the
21 road and holding the two tips, butt end tips of the
22 trees together.

23 No. 38. We can look more closely at the
24 butt ends of the same trees in 37. The lower one is
25 the end of the stem of the tree from the untreated

1- block, the upper one is from the treated block, and one
2 can see here the radial growth response visibly here
3 for the same two trees that were in No. 37.

4 A few more general views to illustrate
5 the conditions. This one, also five years after
6 treatment, taking the same date as those preceding
7 three photographs, where there was a residual tree
8 along the edge of a block and this actually is between
9 two of the blocks that I showed in those earlier aerial
10 views.

11 Most of the -- two-thirds of this
12 photograph to the right clearly shows a glyphosate
13 treated block and just on the left edge is the
14 untreated control block. That road that I used for
15 reference in the earlier photograph can just be seen in
16 the back where our vehicle is parked, background
17 centre.

18 The residual tree that was between the
19 blocks was climbed by Dr. Newton and this photograph
20 and the one which follows, which is No. 40, were taken
21 from up in that tree.

22 I am now standing in this photograph
23 right on the edge of the treatment. To your left is
24 the edge of the untreated control block and to the
25 right is the side of a glyphosate treated block. This

1 is also five years after treatment.

2 Q. How would you compare the species
3 composition and characteristics on the untreated block
4 versus the treated in that photograph?

5 A. The right is well stocked with
6 potential crop trees with very little competing
7 vegetation, and the left is clearly dominated by
8 species which are of poor quality and they have
9 essentially suppressed the crop trees to the point that
10 they are no longer a viable component of the stand.

11 Q. That was photograph No. 40?

12 A. This one is No. 40.

13 No. 41 is six years after treatment,
14 going back into one of the triclopyr treated blocks,
15 taken in August '83, showing the mix vegetation which
16 was present in the block, but also showing desirable
17 crop trees in a dominant position.

18 The taller tree in the centre foreground
19 next to the range pole is a red spruce, probably red
20 spruce, black spruce hybrid as they occur on these
21 sites. It's very similar to the growth behaviour of
22 the black spruce. Showing good vigor and height growth
23 six years after treatment.

24 Going to the adjacent control block, the
25 untreated one, and here we have the opportunity of a

1 side by side comparison. This is a view inside the
2 control block eight years after treatment. This was
3 the adjacent block, the photograph was taken two years
4 later. This one was taken in the spring because it
5 necessary to get in there before the brush leafs out in
6 order to have enough light to take the photograph.

7 So the comparison, if I switch back to
8 the six years after treatment and the treated block and
9 then forward again to No. 42, the eight years after
10 treatment in the control block, one can see that from a
11 commercial standpoint or from any point of utility,
12 this untreated block has developed into a stand that is
13 not productive by any standards.

14 And then as a final photograph, No. 43,
15 taken in 1986, eight years after treatment, just an
16 edge where one of the herbicide treated blocks had just
17 been precommercially thinned.

18 I don't have photographs to carry it
19 beyond, but these trees then responded, some vegetation
20 resprouted, but one can see the beginning of a very
21 viable, from a commercial standpoint, forest. And in
22 talking personally with the precommercial thing crews,
23 they were ecstatic that they were able to go into these
24 treated blocks to carry out the precommercial thinning
25 because they had choices of crop trees, they had more

1 mobility and they were able to carry out a better job
2 in a more productive work schedule.

3 That completes the photographs which I
4 have.

5 Q. Thank you, Dr. McCormack.

6 Mr. Stanclik, could you turn the lights
7 back on, please.

8 Dr. McCormack, apart from the work that
9 you have been involved in in the Austin pond area, have
10 you reviewed, for presentation to the Board, studies
11 recording upon the growth and yield results achievable
12 through the use of herbicides?

13 A. I have. I have reviewed a variety of
14 studies and also tried to obtain data from any valid
15 plot measurements, which were readily available, to try
16 to summarize growth responses that were typical of
17 species which occur in the area of the undertaking.

18 Q. Can you assist the Board as to the
19 results of that review and those inquiries?

20 A. I can try to assist the Board in
21 reviewing that information. I would refer you to,
22 first, within the section on growth and yield data
23 within the statement of evidence, Table 8 on page 128.
24 I think I can help move this along if I put this
25 overhead projector up and I can refer to these tables.

1 Q. That's fine.

2 MS. CRONK: Madam Chair, while Dr.
3 McCormack it putting the projector up, you will recall
4 that as part of the errata filed at the beginning of
5 this panel's evidence there was amended version of
6 Table 8 provided to the Board. That was part of
7 Exhibit 1132.

8 DR. MCCORMACK: In this case it's
9 properly easier to refer to the table on page 128, but
10 to use this transparency of that table as matter of
11 reference --

12 MR. CRONK: Q. If I could interrupt just
13 for a moment, Dr. McCormack.

14 Madam Chair, this is a further copy of
15 amended Table 8. (handed)

16 MADAM CHAIR: Thank very much.

17 Ms. Cronk, were you going to take our
18 books away and put in the corrected tables?

19 MS. CRONK: Yes, and we will do that at
20 the break if you would care to leave them for us, Madam
21 Chair.

22 MADAM CHAIR: Thank you.

23 MS. CRONK: Q. Sorry, Dr. McCormack.

24 DR. MCCORMACK: A. These are numerical
25 data that are broken down by crop trees or region,

1 mainly crop trees. The left most column reflects crop
2 trees. The next column in has a series of numbers
3 which relate the period of response in years for the
4 data which are shown, and then most importantly the
5 third column shows relative growth or volume increase
6 as a per cent.

7 So all the numbers in that third column
8 are percentages, and then the right most column simply
9 gives the reference or source of information from which
10 these numbers came.

11 I think beyond that the table is simply
12 an illustration of some hard numbers, growth responses,
13 some of which are quite dramatic, but I think the main
14 thing to see here is a consistent pattern of strongly
15 positive growth responses across several species that
16 could be typical of the area of the undertaking with a
17 variety of treatments.

18 Some of the older treatments, and those
19 being some up higher on the list, actually reflect
20 results from manual type treatments since herbicide
21 technology was not readily available to those workers
22 at the time of the study. Then as the shorter time
23 periods of response are shown, these all reflect
24 herbicide treatment responses. The more recent ones
25 from New Brunswick and Ontario reflect the more recent

1 herbicide treatments that are the practice of the day.

2 Q. Can you highlight some of those
3 studies, Dr. McCormack, for the Board with reference to
4 those that you consider to be of particular interest?

5 A. Well, I think I would direct
6 attention to the species where species might be of
7 interest, where we go red pine to jack pine and then a
8 series on black spruce. There are some that reflect
9 data specifically from the area of the undertaking.

10 Where people have felt that maybe black
11 spruce is not one of the more responsive species, I
12 would direct attention to the numbers here for black
13 spruce and show that the lowest response, which is the
14 older study which would reflect a phenoxy treatment
15 that might not have been as effective as the more
16 recent ones, is a 75 per cent improvement. Everything
17 else exceeds a hundred per cent. And that's certainly
18 significant when a manager is trying to bring younger
19 trees on line and get them into a healthy, productive
20 growth pattern.

21 Q. I am just looking at the title of this
22 table, Dr. McCormack, it is Table 8 and it is entitled
23 Tree Response to Release Shown as Per Cent Increase in
24 Growth and Volume Over Untreated Controls.

25 Does this table relate exclusively to

1 herbicide release treatments apart from the two you
2 have indicated or to a variety of forms of release
3 treatments?

4 A. I have to go back, but certainly I
5 think we have got the -- these pine studies in the
6 upper portion involve some mechanical and manual
7 treatments, but from there on, even this 16 year
8 response in New Brunswick on the black spruce, are
9 involve herbicide.

10 Q. And still dealing with the statement
11 of evidence, the next table is Table 9, can you help
12 the Board as to the nature of the information contained
13 in it?

14 A. Table 9 is on page 130 of the
15 statement of evidence and this is a similar summary of
16 growth response data expressing differences as per cent
17 volume increase over untreated. The age at release is
18 also shown and, again, we have the time period of
19 response. These time periods range fairly long, 25, 22
20 and 18 years. These data are for red pine and white
21 pine.

22 The reason this set of data is separated
23 out in a separate table is parts of this information,
24 which was reported by Buckman and Lundgren, broke down
25 the data into two levels of release. See, this was

1 carried out by manual means, so they were able to
2 impose two levels: A full release removing all the
3 competing stems around the crop trees and a moderate
4 release which was only a partial, an intermediate level
5 of removing the competing vegetation, and it provides a
6 comparison of growth responses where two different
7 levels of release had been carried out and that's why
8 this set of numbers is separated out.

9 Q. Looking at that comparison, what
10 observations, if any, can you offer to the Board as
11 to the correlation, if any, between the degree of
12 response and the degree of release?

13 A. Well, we can see in the case of red
14 pine full release is one hundred per cent improvement
15 and the moderate release is 51 per cent. So the full
16 release is, by these numbers, twice as good as the
17 moderate release. With the white pine, the full
18 release provided the benefit of 649 per cent and the
19 moderate release of the white pine 235, so almost a
20 threefold difference.

21 Q. Still dealing with manual release at
22 page 129 of your statement of evidence, you refer to a
23 study done by Yang et al. Can you outline for the
24 Board, please, what was involved in that study?

25 A. Well, this one is interesting because

1 it reports 30 years since treatment. Yang just
2 recently, in 1989, published this. It was a study of
3 aspen competing with white spruce in Manitoba and
4 Saskatchewan and these were manual treatments, in part
5 of this study it was multiple treatments carried out
6 starting in 1936.

7 So this is not an indication of what
8 herbicides might have done at that point, but it does
9 show the benefit of releasing the white spruce where
10 Yang reports diameter at breast height improved 177 per
11 cent and total volume increased 93 per cent as a
12 response to the release treatments.

13 This is included just to illustrate that
14 here in 1989 we are -- continue to get reports of older
15 studies that are consistently indicating the benefit of
16 release or what we were referring to here as tending.

17 If I can then move on to what is No. 34
18 on my list of overhead transparencies and referring to
19 Table 10 which is on page 132. This table summarizes
20 the data that were reported by MacLean and Morgan in
21 1983 which illustrates 28 and 32 year response of
22 balsam fir. It also includes data reflecting chemical
23 release, as well as manual release. The data are shown
24 in the table.

25 I think what they show is best indicated

1 in the response portion at the lower part of the table
2 where for chemical release, 20 years later on plot 15,
3 there was a 265 per cent greater fir volume than the
4 control and for plot No. 16, a 157 per cent greater fir
5 volume than the control, and then plot 18, 32 years
6 following manual release, it shows there was a 64 per
7 cent greater fir volume than the control for plot 18.

8 Q. The title of this graph and the
9 study, Dr. McCormack, the title indicates that 28 and
10 32 year response of balsam fir. It is usual or unusual
11 to have growth and yield data for a time frame of that
12 kind, 28 and 32 years?

13 A. This study is unique because it's now
14 one of the oldest, probably the oldest in the
15 northeastern portion of our continent where we have had
16 continuing observations and data. It is certainly
17 unique in that aspect.

18 One reason for the differences there is
19 the manual release, you can notice, was carried out 32
20 years ago and then as the herbicide treatments became
21 part of practice in northern New Brunswick where this
22 study was carried out, 28 years prior to gathering
23 these data, the chemical release was carried out.

24 This was a study in the Green River area
25 in northern New Brunswick which in fact was carried

1 out -- established and carried out in its early stages
2 by Gordon Baskerville when he was working up in that
3 area. So those of us that review this data refer this
4 as the Baskerville study rather than MacLean and
5 Morgan.

6 Q. You have also referred in your
7 statement of evidence, Dr. McCormack, the work by
8 Perala, if I am pronouncing it correctly, concerning
9 conifer release. What is involved in that work?

10 A. This one is included as a summary
11 description. It starts toward the bottom of page 134
12 and then carries over on to page 135 of the statement
13 of evidence.

14 Perala in working with a -- preparing a
15 review for a conference addressing regeneration of
16 conifers in the Lake States region, the proceedings
17 where published in 1982, did a review of 41 references
18 and went back to 1941. So this also substantiates the
19 consistent pattern of positive responses from release
20 treatments.

21 Here are summarized his conclusions from
22 reviewing those 41 references, appropriate to
23 regenerating conifers in the Lake States region and
24 they are listed there showing when these conifers are
25 released from forest weeds they -- this is comparing

1 release to not release, the survival was 43 per cent
2 better, the height growth was 120 per cent better and
3 the weight growth, which is an indication of the amount
4 of conifer biomass produced or in fact in effect the
5 volume produced, was 814 per cent greater as compared
6 to unreleased conifers in that region. That's a
7 general summary from the 41 references.

8 Further, Perala from his review found
9 that release determined plantation success, that was
10 the major determining factor. He also found that the
11 earlier the release, making reference to the timing
12 within the life of the regenerating conifers, the
13 greater was the relative height gain. This comes back
14 to the principle of proper timing of herbicide release.
15 He also found that where it had been studied, that
16 controlling root competition was an important factor to
17 gain increased height growth.

18 This kind of information is important
19 when we compare herbicide release with manual release,
20 for example. Herbicide release will suppress the root
21 competition, manual release will not suppress it, in
22 some cases may stimulate it. So controlling root
23 competition was found to be important.

24 And then another summary of the
25 information looking at age 40 of the trees without

1 overstorey competition, red pine was 117 per cent
2 taller, white pine 86 per cent taller, jack pine 40 per
3 cent taller than equivalent trees that had overstorey
4 competition.

5 So that's a compilation conducted by
6 Perala in reviewing 41 references over a fairly
7 extensive period of time.

8 Q. Still dealing, Dr. McCormack, with
9 the data available in the reported literature, could I
10 ask you to refer to Figure 3 in the statement of
11 evidence and to explain for the Board the information
12 contained in it?

13 A. Figure 3 on page 137 of the statement
14 of evidence is a figure extracted from the text edited
15 by Walstad and Kuch.

16 Q. Sorry, what text is that, please?

17 A. This is a reference work put together
18 by a group of about 22 authors that addresses the
19 forest vegetation management for conifer production.
20 It was a combined effort of a nationwide team with
21 several reviewers.

22 This figures comes from the chapter which
23 pertains to vegetation which would be typical of the
24 area of the undertaking and this figure was selected in
25 compiling that chapter because it illustrated very

1 nicely the relationship, in this case, for planted red
2 pine relative growth expressed as a per cent of what it
3 would be in full sunlight. So that the comparison here
4 is decreasing amounts of full sunlight which are
5 available to these planted red pine crop trees.

6 And three curves are shown here. Going
7 from left to right, you can see that the hardwood
8 overstorey expressed as basal area and basal area here
9 is square feet per acre. That is the cross-sectional
10 area of the stems 4 1/2 feet above the ground. So one
11 can see that it increases from left to right, and then
12 the per cent of growth achieved as a per cent of full
13 sunlight increases along the vertical scale.

14 The left -- I'm sorry, right most curve
15 is for height growth, the one which I have marked in
16 blue, the centre curve, which I am highlighting in red,
17 is for diameter growth, and then the lower curve,
18 marking with blue "x"s, reflects the volume growth over
19 changing amounts of hardwood overstorey and those
20 curves are fairly typical of conifer growth responses
21 in our region as levels of competing vegetation,
22 reflected here as basal area of hardwood overstorey,
23 increase.

24 Q. And what do they indicate?

25 A. They indicate that as hardwood

1 overstorey basal area increases, that the three
2 variables plotted decrease as well, so that by the time
3 one gets into the area, 40 to 50 square feet per acre
4 of hardwood basal area, our volume growth is down to 20
5 per cent or below what could have been achieved in
6 sunlight.

7 Q. Which of those parameters appears,
8 based on this graph, to be most sensitive to release?

9 A. Well, actually they all combine. The
10 combination of height growth and diameter growth
11 determines volume. So from an operational standpoint,
12 truly volume is the one that means most to the manager.
13 I guess I would have to look at them within that
14 perspective.

15 Q. You said, Dr. McCormack, that the
16 information presented in this graph, as I wrote your
17 words down, was typical of conifer responses in our
18 area. What area were you referring to?

19 A. I am referring to what I call
20 northeastern North America which I take is the Province
21 of Ontario, east to Newfoundland and south to an area
22 somewhere along the upper edge of New York State.

23 Q. I should perhaps put a similar
24 question to you with respect to the Perala data, Dr.
25 McCormack. You indicated to the Board that that was

1 based on information related to regenerated conifers in
2 the Lake States. Is the area of the undertaking part
3 of the Lake States region in your view?

4 A. Well, what we call Upper Great Lakes
5 region is that portion of commercial forest land around
6 the Great Lakes which would be in the Great Lakes
7 region directly south of the Province of Ontario.
8 There are similar species and similar conditions there.

9 Q. Then moving to Figure 4 at page 13,
10 what is the nature of the data contained in it?

11 A. Figure 4, which is the 37th
12 transparency, is a summary I compiled of data measured
13 on the Austin Pond study -- data gathered at the Austin
14 Pond study nine years after release.

15 This is an average across the plots
16 summarized in a way that balsam fir volumes are plotted
17 across hardwood overtopping the balsam fir which runs
18 from left zero to 100 per cent at the right, which is
19 reflected on the upper horizontal scale.

20 The spruce show -- are plotted across
21 number of hardwood stems within 91 centimeters of the
22 crop tree ranging from zero on the left to 10 on the
23 right. The trees reflected in these data are all
24 individual spruce or fir crop trees that were not
25 competing with other spruce or fir. The only

1 competition in the evaluation of these trees is
2 overtopping hardwoods or hardwood stems within 91
3 centimeters of a spruce.

4 In case one wonders why the 91
5 centimetres, we did the plots in English units and
6 that's a yard, which is what we use.

7 On the vertical scale is average crop
8 tree volume expressed in cubic decimeters and the two
9 curves are shown. The sharper slope is for balsam fir,
10 the other one is for spruce which is a combination of
11 the spruces on the site.

12 Q. What does this indicate, Dr.
13 McCormack? Let's deal first with balsam fir.

14 A. Okay. Balsam fir with no overtopping
15 hardwoods had an average volume of -- approximately
16 from this curve, 4.75 cubic decimeters, down to where
17 they were 100 per cent overtopped, approximately .4
18 cubic decimeters. So across that range of zero per
19 cent overtopping to 100 per cent overtopping, the
20 volume decreases from 4.75 cubic decimeters per tree to
21 about .4 cubic decimeters per tree.

22 Q. And in the case of spruce?

23 A. Spruce. Where there are no hardwoods
24 within 91 centimeters, the average crop tree volume was
25 something in the neighbourhood of 2.6 cubic decimeters,

1 going to 10 hardwood stems within 91 centimeters of the
2 crop tree, a volume of about 1.4 cubic decimeters.
3 These two lines are regression lines which were
4 developed from a large number of individual tree
5 measurements across the site.

6 Q. What relationship, if any, Dr.
7 McCormack, do these regress lines have to degree of
8 release? Is this relevant to the degree of release?

9 A. Yes. The more effective the release
10 in reducing competing hardwood stems, the left part of
11 the figure, the higher the volumes and the slope of the
12 curve -- of each curve directly reflects the increasing
13 numbers of competing hardwoods. So as they increase or
14 the effectiveness of the release treatment decreases,
15 the volumes drop off.

16 Q. Thank you. And Figure 5?

17 A. Figure 5 in the statement of evidence
18 on page 140 is my No. 38 in the overhead
19 transparencies. This is also a figure extracted from
20 the same chapter as the Benzie's figure from Walstad
21 and Kuch's reference book on vegetation management for
22 conifer production.

23 These data, however, come from the Austin
24 Pond study site height growth data which don't reflect
25 all the response. One really needs some radial growth

1 and volume, but these were four year height growth data
2 for balsam fir on the left, red spruce on the right.
3 These data were taken from transects run through
4 treated and untreated blocks.

5 Where a curve is labelled release, those
6 were trees encountered on a sample line transect
7 through the centre of the block. So that in the case
8 of balsam fir, the line encountered 35 released crop
9 trees. In the case of the red spruce, the line
10 encountered 60 released crop trees. Their height
11 growth was averaged and is reflected in the first,
12 second, third and fourth year following release.

13 Similarly, sample lines were run through
14 control or untreated blocks. In the case of balsam
15 fir, 54 potential crop trees were encountered, and red
16 spruce, 30 crop trees were encountered. And there
17 also, first, second, third and fourth year height
18 growth are shown in the dash line curves, and one can
19 readily see here the better height growth of the
20 release trees as compared to the controls.

21 Q. And then Figure 6, Dr. McCormack, at
22 page 141 in your statement of evidence?

23 A. Figure 6 on page 141 is transparency
24 No. 39. This is a figure I compiled from the raw data
25 at Austin Pond to illustrate crop trees per hectare,

1 shown here in the bottom box of the figure, and in the
2 upper boxes a more thorough compilation of average
3 individual tree volumes, all the volumes again
4 expressed as cubic decimeters.

5 What is shown here are summaries of some
6 average figures across all the treatments. The upper
7 box is spruce, the centre box is balsam fir, the lower
8 box shows crop tree stocking, and in the centre box the
9 treatments are labelled. So the left most bar
10 represents the equivalent numbers from the untreated
11 plots, averages across all the replicates. So this
12 left most bar shows volumes for spruce, fir and crop
13 tree stocking in the untreated.

14 The next pair of bars reflects what at
15 the time was basic phenoxy treatments of 2,4-D plus
16 2,4,5-T. The next pair of bars, which I have
17 highlighted here in this figure in green, show the
18 responses of two rates of glyphosate, and then the
19 right most bars are responses of two rates of
20 triclopyr.

21 So that if one takes crop tree stocking
22 as a reflection of the numbers of the crop trees which
23 in turn average -- have average volumes that are
24 reflected in the upper two sets of bars, one can begin
25 to see the type of thing that I illustrated in the

1 photographs of the superior volume growth and
2 development on the treated blocks as compared to
3 untreated.

4 Not only are the average volumes of the
5 untreated trees less, there are fewer potential crop
6 trees on the site as compared to the treated plots.
7 This pulls more things together and also illustrates
8 how the new chemistry relates to the old phenoxy
9 chemistry in terms of growth responses.

10 Q. Looking at crop tree stocking, can
11 you made any observations as to the results achieved
12 from the combined 2,4-D treatment as compared to the
13 glyphosate treatment?

14 A. Well, they are very, very similar in
15 terms of numbers. I don't have a statistical test of
16 this comparison, but looking at these bars, I would
17 expect there is not a significant difference, they are
18 essentially the same.

19 Q. And dealing more particularly with
20 the stocking results in the Austin Pond area --

21 A. Okay. I have a transparency which is
22 not directly in the statement of evidence that is No.
23 40 on my transparency list and this is simply a tabular
24 presentation of those stocking numbers.

25 As I go through a consideration of this

1 kind of subject matter, the question consistently comes
2 up: Do we really gain a crop tree stocking advantage.
3 So in an attempt to emphasize that point, I have taken
4 the numbers that helped to compile that last graphic
5 and I have summarized here the crop tree numbers across
6 a variety of the treatments that were applied in the
7 Austin Pond study.

8 It's qualified in the footnote, a
9 consideration here was spacing, that we had well
10 distributed crop trees; consequently, somewhat
11 mechanical numbers here, but I think looking at the
12 averages from the controls of 432 crop trees versus
13 anything from 1,200 up to 1,500 crop trees, that
14 benefit of herbicide release is quite evident from this
15 table.

16 Q. And the data in this table is taken
17 from where?

18 A. This is also data collected across
19 the treatments of the Austin Pond study site. This is
20 nine years after treatment, 16 years after harvest.

21 Q. Is there any data available dealing
22 with growth and yield information, of which you are
23 aware, greater than nine years with respect to conifer
24 release, apart from the MacLean and Morgan study that
25 you referred to earlier?

1 A. Any others that I referred to, there
2 are data coming along. Of course, we want to get into
3 the Austin Pond study site because it is long enough
4 that we can gather more data, but just recently within
5 the last weeks the Department of Lands and Forest in
6 the Province of Nova Scotia published one of their
7 reports that relates some 10 year results following
8 glyphosate treatment for Norway spruce plantations.

9 Q. And you have put up a new overhead.
10 Before you get into the actual data in it, Dr.
11 McCormack, what does it relate to?

12 A. This relates to the results of the
13 measurements of those Norway spruce plantation study
14 sites in Nova Scotia, a study conducted by the
15 Department of Lands and Forest, where they are showing,
16 relative to the rates of glyphosate application, three
17 rates as compared to a control, control is indicated
18 here as zero, for ground and two rates compared to a
19 control for aerial application.

20 They show number of stems per hectare of
21 Norway spruce, crop trees and they also show a number
22 of hardwood stems per hectare at the ten year point
23 following treatment.

24 MS. CRONK: Could I ask you to stop there
25 for a moment. Madam Chair, I would like to tender a

1 copy of this report as the next exhibit. It is
2 entitled Norway Spruce Release with Glyphosate, Ten
3 Year Results.

4 MADAM CHAIR: That will be Exhibit 1184.

5 ---EXHIBIT NO. 1184: Report entitled Norway Spruce
6 Release with Glyphosate, Ten Year
7 Results.

8 MS. CRONK: Q. Dr. McCormack, then, with
9 relation to the data contained in this study and
10 summarized on this overhead, could you indicate to the
11 Board, please, what its significance is in your view?

12 DR. MCCORMACK: A. Well, these numbers
13 indicate in a very general way the condition of the
14 stands 10 years after treatment for ground and aerial
15 application at varying rates. Some of these rates are
16 high as compared to current operational rates of today,
17 but these plots were established before managers were
18 aware of what would be effective rates; consequently,
19 they were tested.

20 It shows numbers of crop trees and
21 numbers of hardwood stems and the benefit of aerial
22 application. One problem that occurred was that a
23 mechanical site preparation had preceded the planting
24 and there were some losses from frost, but one can see
25 from these numbers decreases in hardwood stems in a

1 general way as compared to increases in crop tree stems
2 as a response to treatment.

3 I think these types of comparative
4 differences are best expressed when we go forward one
5 more step and measure the tree volumes.

6 Q. All right. Before we move to the
7 tree volumes, just for a moment, can you -- is it
8 appropriate in your view to make any comparison between
9 the results reported for the ground application
10 treatments as compared to the aerial application
11 treatments in this study?

12 A. Well, I indicated that the rates are
13 high and they are certainly higher in the ground
14 application. They were two different study sites.
15 Consequently, it's most appropriate or really required
16 that the aerial application be viewed as one study
17 package and the ground application be viewed as one
18 study package. They each had their own controls and it
19 would be inappropriate to cross-compare in this case
20 between the aerial application and the ground
21 application.

22 Q. Were the levels and type of
23 competition present on the ground treated areas similar
24 or dissimilar to those characteristics on the aerially
25 treated areas?

1 A. It is my understanding that the
2 competing vegetation was more severe on the study site
3 for the ground application.

4 Q. Does the study also indicate volume
5 results, which is what you mentioned a moment ago?

6 A. It does and I have that summarized
7 graphically from the recent publication in my
8 transparency No. 42, which is a bar chart of the
9 average tree volume for these ten-year results
10 following glyphosate release in Hanis County, Nova
11 Scotia. Data measured by forestry personnel of the
12 Department of Lands and Forest.

13 And we can split this one down the
14 middle, if you will, ground application being the four
15 bars on the right, aerial application being the three
16 bars on the left with the bar highlighted in red
17 representing the control, that's the left most bar in
18 each case.

19 I have also indicated here the total
20 volumes applied as a reflection of what I referred to
21 earlier about comparing aerial with ground
22 applications. 56 litres per hectare total volume on
23 the aerial, 224 litres per hectare total volume on the
24 ground application. The rates are shown as litres of
25 product per hectare for aerial application, 4.72, which

1 is within the realm of today's operational treatments,
2 6.29 which is just a .29 amount beyond the upper limits
3 of glyphosate Vision application. The ground
4 applications, going from left to right, are 6.29, 7.86
5 and 9.44.

6 The average tree volumes in cubic -- in
7 thousands of cubic centimeters, are reflected in the
8 heights of the bars and the numerical value for each
9 bar is placed at the top of each bar.

10 Q. What do they indicate?

11 A. They indicate positive growth
12 responses where the trees were treated by herbicide and
13 interestingly, the aerial application of the 4.72 which
14 would be fairly typical of an operational treatment of
15 today, shows the greatest gain of 12.269 versus 3.249
16 of the control.

17 I think this also reflects a bit that as
18 one were to go to higher rates, that you don't
19 necessarily get gains. Because a little is good, it
20 doesn't mean a lot more is better. He points out the
21 value of a proper prescription.

22 Q. Then, Dr. McCormack, if I could ask
23 you to return to the statement of evidence and Figure
24 7, does it relate as well to growth and yield
25 principles?

1 A. Figure 7 on page 142 is my
2 transparency No. 43. This is a figure illustrating
3 yield assumptions. This figure was compiled by a
4 colleague of mine, Dr. Robert Seymour, and me. We put
5 this together based on data we had been collecting and
6 data which were available to us from the U.S. Forest
7 Service forest surveys in the State of Maine.

8 These curves are for spruce fir on good
9 sites growing in the State of Maine and then it would
10 be what we call site index 60, meaning at age 50 the
11 crop trees would be 60 feet tall. We would consider
12 that under our conditions a fairly good site, but this
13 is representative of several million acres of spruce
14 fir commercial land across northern Maine of the same
15 species about which we have been talking.

16 These are yield assumption curves showing
17 yield in cords per acre, which is our standard English
18 unit to reflect yield, but really these are comparative
19 curves and one does not have to become preoccupied
20 with the units. Age runs from 20 to 70. The curves
21 are cumulative relative to silvicultural effort.

22 Q. What does that mean?

23 A. Well, for example, the lower curve
24 says no silviculture. In effect, we take the spruce
25 fir stand as it is and we let it grow and we do

1 nothing. The end result here, as shown, is 20 cords at
2 age 70. So that's 20 cords harvested from an acre at
3 age 70 where there was no silviculture.

4 Then if we make one assumption and apply
5 one treatment, that is reflected in the next curve.
6 The assumption is that we have adequate stocking of
7 crop trees. That's what I mean by regeneration. We
8 have to have the trees there. The herbicide treatment
9 in part would provide that, and we apply one timely
10 herbicide treatment under conditions where it would be
11 effective. With that single silvicultural entry and
12 one assumption, the growth responses would enable that
13 forest under those conditions to yield 48 cords in 50
14 years.

15 What we've learned in working with these
16 numbers is that the herbicide treatment is the most
17 important treatment in a silvicultural sequence and
18 becomes prerequisite for the other treatments, one of
19 which is reflected in the next curve. PCT refers to
20 precommercial thinning. That would mean if it is
21 natural regeneration which we've considered up to this
22 point, we would have to precommercial thin it so that
23 we have a desirable distribution of crop trees across
24 the site. The other option would be to satisfy that
25 need through planting. One or the other to assure us

1 that we have our crop trees properly distributed across
2 the site.

3 With that step, realizing that to reach
4 this point the herbicide treatment is a prerequisite,
5 we reach the point of 51 cords per acre in 40 years.

6 The last curve relates to possible gains
7 based on tree improvement and forest genetics
8 introducing some figures provided to us by the forest
9 geneticist in our region. That, of course, requires
10 planting and the use of proven genetically superior
11 trees. If one were to reach that point, it indicates
12 that we could achieve a yield of 71 cords in 40 years.

13 Q. Dr. McCormack, stepping back then
14 from this graph of yield assumptions and all of the
15 other overheads that you have shown to the Board in the
16 last half hour with respect to these various growth and
17 yield studies, what do you conclude from all of this
18 data.

19 A. I conclude what is in fact a
20 statement which is in the statement of evidence
21 actually later on that is preliminary to Section 9 on
22 page 196, which is a simple statement that pretty well
23 expresses what has been going on here, except I would
24 have to, for my portion of the evidence, point out that
25 I am referring here to tending and for my evidence

1 evidence I am referring to herbicides, that it is a
2 sound practice.

3 And what I have tried to show here in
4 these numbers this morning is that there is a very
5 distinct benefit, growth responses, crop tree stocking,
6 health and vigor, all the things that I have tried to
7 illustrate in these photographs, as well as the growth
8 data.

9 Q. Is there, in your opinion, Dr.
10 McCormack, any need for additional growth and yield
11 data for timber managers concerning the response of
12 softwoods to herbicide treatment?

13 A. Well, there is definitely a need.
14 Certainly as the technology changes and as we learn
15 more and as we come to grips with what's going on in
16 particular sites, I think it is important to better
17 understand what the growth responses are, to better
18 understand what levels of suppression of competing
19 vegetation are important in achieving target levels of
20 growth responses and yields.

21 And we, the professional foresters, must
22 realize that what we have observed in the way of
23 dramatic growth response that are evident to us in the
24 field, must be described in a way of numbers that can
25 be brought into the corporate rooms of decision-makers,

1 policy makers, the legislators and so forth, so that
2 numbers are there to better reflect what we have
3 observed visually in the field, and we have been
4 somewhat remiss in not compiling those numbers.

5 Q. Given that, Dr. McCormack, is there
6 in your opinion sufficient existing data on growth and
7 yield to draw any conclusions regarding the efficacy of
8 herbicide treatments for timber management purposes?

9 A. Certainly there are data and I have
10 tried to show some of those here this morning, to show
11 that the responses are consistent, the responses are
12 dramatic, they are very positive where herbicide
13 treatments have been properly prescribed and carried
14 out under workable conditions. I personally don't know
15 of any cases where positive responses have not been
16 observed or measured. We need more numbers.

17 Q. Going back to Austin Pond just for a
18 moment, Dr. McCormack. What harvesting system was used
19 at Austin Pond?

20 A. It was a commercial harvest conducted
21 by Scott Paper Company and, as I recall, this was chain
22 saws and skidders, rubber tired skidders.

23 Q. What form of cutting? What method?

24 A. It was a clearcut.

25 Q. And how large is the entire study

1 site area?

2 A. I've actually never measured it.

3 Q. How many blocks?

4 A. Well, our study blocks are only a
5 small part of it. I would expect the entire clearcut
6 within which we placed our study blocks is probably in
7 the neighbourhood of -- it certainly exceeds 200 acres
8 and probably approaches 300 acres.

9 Q. And then finally on this issue, Dr.
10 McCormack, can you look again at your Figure 7, can you
11 put that overhead up again, please.

12 A. This is figure 7.

13 Q. Is this figure and are the yield
14 assumptions depicted in it specific to herbicides or
15 does it apply generally to silvicultural treatments?

16 A. Well, it's a combination of
17 silvicultural treatments, but one curve is significant
18 relative to herbicides because the only cultural
19 treatment applied - and this is the second one up from
20 the bottom labelled regen plus herbicides that I am now
21 highlighting in red that shows the gain from herbicides
22 as compared to the lower curve and I have highlighted
23 that comparison with my red arrow - of the gain from
24 timely application of herbicide.

25 Q. And apart from that line, does this

1 graph assist with respect to silvicultural treatments
2 generally?

3 A. It shows additional benefit from
4 precommercial thinning or properly separating in a
5 planting, and then in cases where genetically improved
6 material is available, the additional gain is possible
7 with that.

8 Q. When you refer to age at the bottom
9 of that graph, what are you referring to?

10 A. I am referring to the effective age
11 of the forest stand in question.

12 Q. And is that the same or different
13 from rotation age?

14 A. That could be considered the
15 equivalent of rotation.

16 Q. Thank you.

17 MS. CRONK: Madam Chair, I note the time.
18 I can advise the Board that I expect to be finished
19 with the evidence-in-chief of this panel within one and
20 a half to two hours outside following lunch.

21 Would the Board wish to rise now?

22 MADAM CHAIR: Mr. Castrilli?

23 Pardon me, Dr. McCormack.

24 MR. CASTRILLI: Yes, Madam Chair.

25 MADAM CHAIR: You will be prepared to

1 begin your cross-examination this afternoon?

2 MR. CASTRILLI: Yes, I will.

3 MADAM CHAIR: Why don't we rise for lunch
4 now and we will be back at 1:30.

5 ---Luncheon recess taken at 12:00 p.m.

6 ---On resuming at 1:35 p.m.

7 MADAM CHAIR: Please be seated.

8 Ms. Cronk?

9 MS. CRONK: Q. Dr. McCormack, can I ask
10 you to look again, if you would please, at your Figure
11 7. I don't think you need put the overhead up, but
12 perhaps you could turn to page 142 of the statement of
13 evidence at which Figure 7 is duplicated.

14 DR. MCCORMACK: Yes, I have it.

15 Q. Now, looking at the first yield curve
16 it applies, you've said, to no silviculture; the
17 second, as you've described it, to regeneration plus a
18 herbicide treatment; and the third to pre-commercial
19 thinning or planting.

20 Dealing with the third for the moment,
21 does that yield curve -- is it incremental to the
22 application of herbicides or discreet from the
23 application of herbicides?

24 A. Well, it's incremental or, as I think
25 I described it, the herbicide treatment is a

1 prerequisite; you don't get to the third curve without
2 in effect going through the second curve. The
3 herbicide -- the timely herbicide treatment is part of
4 what makes that third curve happen.

5 Q. And with respect to the fourth, what
6 is the situation on that issue?

7 A. The fourth one incorporates the
8 technology coming to us from the geneticists and that
9 curve is developed using projected numbers that were
10 furnished to Dr. Seymour and myself by geneticists
11 working with the same species in Maine, and that one
12 implies that genetically superior planting stock of
13 some known source is available, and it's based on
14 numbers that were given to us by the geneticists.

15 Q. And is it incremental to a herbicide
16 treatment or discreet from a herbicide treatment?

17 A. No, no. It also is dependent on two
18 things that are implied in the two middle curves: One
19 is the timely herbicide treatment to reduce the
20 competing vegetation; and, secondly, that these trees
21 are properly planted and spaced on site.

22 Q. Thank you, Dr. McCormack.

23 A. Yes.

24 Q. When you were before the Board last
25 day you testified that, in your view, the

1 appropriateness of the use of herbicides could be
2 measured having regard to three factors which you
3 outlined on an overhead. The first was effectiveness
4 of the use of herbicides, and the second you described
5 as being environmental impact from the use of
6 herbicides.

7 With respect to that second measure that
8 you outlined to the Board, are there any particular
9 factors which, in your view, are relevant to a
10 consideration of that issue; that is, environmental
11 impacts from the use of herbicides?

12 A. Well, in terms of looking at the
13 environmental soundness of herbicide use, there's a
14 wealth of information out there, but there are a few
15 specific areas with which I have worked directly.

16 Q. And would you outline for the Board,
17 please, what you consider to be relevant with respect
18 to that issue based on your own experience, what
19 factors are relevant?

20 A. I have prepared an overhead--

21 Q. Thank you.

22 A. --that summarizes in part some
23 considerations. If I may, first in general,
24 characterize some of the factors as we have observed
25 them over time and this would be -- I'm not sure where

1 we are.

2 Q. If I could assist with that.

3 A. Yes, Ms. Cronk.

4 MS. CRONK: Madam Chair, this is a new
5 overhead that was not included in the original mailing
6 of Dr. McCormack's overheads. I would like to provide
7 copies of it now to the Board, together with two other
8 overheads that he's advised me he will be referring to
9 this afternoon.

10 MADAM CHAIR: Is this one package, Ms.
11 Cronk?

12 MS. CRONK: Yes, it is, Madam Chair.

13 (handed)

14 MADAM CHAIR: Exhibit 1185.

15 ---EXHIBIT NO. 1185: Package of overheads to be
16 referred to by Dr. McCormack in
his evidence.

17 DR. MCCORMACK: Three points have been
18 summarized on this one that are general comments that
19 relate to environmental effects from using herbicides
20 in forestry and I'll try to summarize these briefly,
21 since I know that some of these points have been
22 brought before the Board earlier.

23 The first relates to the frequency of use
24 as compared to other uses of herbicides or similar
25 chemistries. In the production of a crop in forestry

1 treatments are carried out once or sometimes twice
2 during a rotation. This would mean that a treatment
3 would occur once or at the most twice, and probably
4 some unique situations that might require more
5 treatment, but it's unlikely if everything goes well
6 and weather or something doesn't neutralize a treatment
7 in a period of time that might run from 30 to 90 years
8 or more. So it's essentially a one-time treatment.

9 Further to that, the amount of active
10 ingredient used and the way the material is delivered
11 to the site means that relatively low rates are applied
12 and can be done in a relatively precise manner. So
13 that helps to keep the environmental interactions
14 defined and, to a great extent, under control.

15 Secondly, it should be remembered that
16 the reason this is done initially is to modify the
17 vegetation, that's why we refer to it as vegetation
18 management. One should expect a change in the
19 vegetation because that's the purpose of the treatment,
20 that the major effect will be on the vegetation.

21 The material is applied directly to the
22 vegetation, it is a chemistry which interacts with
23 plant physiological processes and of the common
24 herbicides in use today they are water soluble and will
25 not interact effectively with other systems. So we get

1 changes in the makeup of the vegetation that is
2 intended to be expected.

3 Thirdly, the long-term purpose of this
4 herbicide use is to bring about a growth and yield
5 response which is positive, and this is a response of
6 the desirable trees and the intended crop trees.
7 There's a management purpose here, so it is a targeted
8 tool that is placed into the system in a relatively
9 precise way.

10 MS. CRONK: Q. And turning to the second
11 overhead in this package, Dr. McCormack --

12 DR. MCCORMACK: A. The second overhead
13 summarizes some of the studies with which I have been
14 involved, for the most part directly, but at least
15 involved in terms of being a participant and advisor or
16 a reviewer, and by that I mean reviewing the studies
17 and the data collection in the field, and they are
18 summarized here and listed A, B and C; A relating to
19 small mammals and songbirds.

20 And these are summary comments based on
21 work which has been published by D'Anieri and some
22 publications by Santillo where they, as wildlife
23 biologists - in this case the two senior authors have
24 been graduate students or honor students but they are
25 qualified animal biologists - they have studied the

1 small mammals and songbirds on operational spray sites.
2 These studies were imposed on operational spray
3 programs in this case. They were documented, we know
4 exactly what went down, how and when, but these
5 treatments were not put down specifically to study the
6 mammals -- small mammals and songbirds.

7 Q. If I could stop you there, before you
8 go on to elaborate on those studies, Dr. McCormack, and
9 provide the Board with copies of them; the first with
10 respect to the reference to D'Anieri.

11 I'm showing you, Dr. McCormack, an
12 article entitled: Small Mammals in Glyphosate Treated
13 Clearcuts in Northern Maine. Is that the D'Anieri
14 article to which you referred?

15 A. This is the D'Anieri article, yes.

16 Q. And secondly, I'm showing you an
17 article by Santillo et al, 1989 entitled: Responses of
18 Small Mammals and Habitat to Glyphosate Application on
19 Clearcuts. Is that the Santillo article?

20 A. This will be the Santillo paper
21 addressing small mammals.

22 Q. Thank you.

23 MS. CRONK: I'd ask that they be marked,
24 Madam Chair.

25 MADAM CHAIR: Exhibited separately?

1 MS. CRONK: Yes, thank you.

2 MADAM CHAIR: Exhibit 1186 is for the
3 D'Anieri article, entitled: Small Mammals in
4 Glyphosate Treated Clearcuts in Northern Maine, and
5 Exhibit 1187 will be the Santillo article, entitled:
6 Responses of Small Mammals and Habitat to Glyphosate
7 Application on Clearcuts.

8 MS. CRONK: Thank you.

9 ---EXHIBIT NO. 1186: Article entitled: Small Mammals
10 in Glyphosate Treated Clearcuts
in Northern Maine by D'Anieri.

11 ---EXHIBIT NO. 1187: Article entitled: Responses of
12 Small Mammals and Habitat to
Glyphosate Application on
13 Clearcuts by Santillo, et al.

14 MS. CRONK: Q. Dealing with the D'Anieri
15 article first, Dr. McCormack -- perhaps I should
16 provide you with a copy as well, and a copy of the
17 Santillo article. (handed)

18 With respect to the D'Anieri article,
19 there is a Maxwell L. McCormack Jr. referred to as an
20 author; is that you, sir?

21 DR. McCORMACK: A. That's me, yes.

22 Q. Was this a refereed publication?

23 A. This was.

24 Q. And the Santillo article, was it as
25 well a refereed publication?

1 A. This was refereed, published in the
2 Journal of Wildlife Management.

3 Q. And did you have any direct
4 involvement in the Santillo paper concerning small
5 mammals?

6 A. I was on David Santillo's studies
7 committee, I worked with him in the field and had a
8 chance to review the original data and the discussions
9 and text of it.

10 Q. Thank you. And with respect to both
11 of these articles, what summary points are you
12 suggesting are relevant for the Board?

13 A. Well, these together, with yet an
14 additional publication that was -- the senior author
15 was David Santillo.

16 As indicated here, they reviewed small
17 mammals and songbirds, the species of which are
18 summarized here in the papers, a variety of shrews and
19 voles and songbirds which are common to the young
20 forest areas in the State of Maine.

21 They evaluated these, and the overall
22 conclusions are summarized here in points 1 and 2:
23 "the abundance of some species may be affected in the
24 short term. This in response to the vegetation changes
25 that occur because of the herbicide treatment as a

1 change in habitat, not an effect of the chemical
2 directly on the animals; and, secondly, the species
3 richness of the small mammal population was not
4 affected by the herbicide treatment.

5 Q. Do the articles assist in determining
6 whether the alteration in abundance of some species
7 persists for long durations?

8 A. Well, they do; however, they are both
9 short-term studies. That's the nature of studies when
10 you are dependent on graduate students to carry out the
11 data compilation.

12 However, there is more here than meets
13 the eye because the D'Anieri study site became part of
14 one of the Santillo study sites, so although it does
15 not show in the publications it actually covers three
16 years rather than two.

17 And what it indicates is that there are
18 the types of changes that are summarized here, but
19 there is ample evidence in the field that these are
20 short term and totally -- or directly interacting and
21 dependent on the habitat changes, the changes in the
22 vegetation which occur and, as we have discussed up to
23 this point, the vegetation is a very dynamic component
24 on a site. So this changes from year to year.

25 MS. CRONK: Now, I neglected, Madam

1 Chair, to mark the companion article by Santillo
2 dealing with songbirds to which Dr. McCormack's
3 overhead refers, and I would ask that that be
4 perhaps --

5 MADAM CHAIR: That will be Exhibit 1188.

6 ---EXHIBIT NO. 1188: Article entitled: Response of
7 Songbirds to Glyphosate Induced
8 Habitat Changes on Clearcuts by
9 Santillo.

9 MS. CRONK: Q. Dr. McCormack, I'm
10 showing you an article entitled: Response of Songbirds
11 to Glyphosate Induced Habitat Changes on Clearcuts. Is
12 that the Santillo songbirds article?

13 DR. McCORMACK: A. This is the Santillo
14 paper on songbirds.

15 MS. CRONK: That's a little out of
16 order, Madam Chair. (handed)

17 MADAM CHAIR: Thank you.

18 DR. McCORMACK: I might add as these are
19 being distributed, that it was a major study conducted
20 by Santillo where he measured the populations and
21 gathered data for both songbirds and mammals, and then
22 to facilitate the publication, that large package of
23 data was broken down, the result of which are the two
24 different papers which are before you, one on small
25 mammals, one on songbirds.

1 MS. CRONK: Q. And then in the second
2 part of this overhead, Dr. McCormack, you refer to
3 certain other studies. And could you elaborate on
4 those, please, and the nature of the effects dealt with
5 in them?

6 DR. MCCORMACK: A. Okay. The second
7 portion refers to effects on plant communities which,
8 as indicated here, is the vegetative cover on a site.
9 This includes the vegetation data gathered by Santillo
10 which coincided with the collection of his data on
11 mammals and songbirds, and also a study of browse
12 material at the Austin Pond study site which has been
13 published and I referred to earlier today where the
14 senior author was Dr. Newton, and I believe that's
15 Exhibit 722. So the reference here to Newton is
16 Exhibit 722.

17 The Santillo references actually are
18 addressed in the two which have just been presented and
19 those were Exhibits 1187 and 1188, and in these the
20 information is summarized that the vegetation cover
21 recovers two to three years after herbicide treatment
22 and the data indicates that the diversity of plant
23 species is not reduced as we look into longer term
24 effects as we go along from the point of treatment.

25 Q. Do you have a copy of Exhibit 722

1 there, Dr. McCormack, the Newton article?

2 A. Yes, I do. Yes, I have a copy here.

3 Q. What was your involvement, if any,
4 with this article?

5 A. Well, I was a participant in the
6 study. I was a participant in the field gathering data
7 and reviewing the information. It was the same study
8 site I described this morning which I established and I
9 applied the treatments. As implied by the position for
10 my name on the list of authors I was not the most
11 active participant in putting the text together on this
12 case, though I did work with the data and reviewed it
13 as it progressed toward this end result.

14 Q. Is the Journal of Wildlife Management
15 a refereed journal?

16 A. Yes, it is.

17 Q. And with this exhibit in front of
18 you, could you elaborate for the Board, please, on the
19 third category of effects discussed in your summary
20 document, Exhibit 1185?

21 A. Yes. The category here under C is
22 effects on browse availability and quality and there
23 are two summary comments there with reference to
24 Exhibit 722.

25 This is that browse reductions are short

1 term following operational treatments - these being
2 operational herbicide treatments - and browse
3 availability and quality can be improved by herbicide
4 use, and these have been our conclusions from data
5 presented in this study and related observations on
6 other operational treatments.

7 Q. With respect particularly to Exhibit
8 722, the article co-authored by yourself and Dr. Newton
9 and others, could you explain to the Board what was
10 done at the Austin Pond site for the purpose of this
11 evaluation; what was involved in this study?

12 A. Well, it's described in the section
13 under Study Area and Methods, whereby a system of plots
14 and surveying of the treated areas was carried out.

15 One procedure that has been discussed was
16 a visual estimation was preferred over point frames or
17 grids because, as described here, the vertical
18 stratification and difficulty of physical access on the
19 336 sample points.

20 One observer reported these estimates,
21 though others of us stood by while that was done. The
22 one observer was Michael Newton. Dr. Newton has done
23 this type of work for over 30 years.

24 Q. Sorry, what was he observing?

25 A. He was observing the vegetation -- he

1 was estimating the amount of vegetation which
2 contributed to the data shown in Table 3 that was
3 developed, the estimate in this procedure. He
4 developed the estimates which quantified the amount of
5 browse material on the site.

6 Q. And what does Table 3 indicate with
7 respect to the observations made at the Austin Pond
8 site?

9 A. Table 3 across the various treatments
10 present summarizes the amounts or per cent of deciduous
11 woody cover by treatment, and this expression of the
12 amount of woody cover is broken down into three height
13 classes which are indicated there in the table; less
14 than one metre and on up to more than 2.5 metres, and
15 from this were developed the browse indices which are
16 shown in the right most column as a ratio to the amount
17 of browse material present on the control or not
18 herbicide treated blocks.

19 Q. In the end, Dr. McCormack, what is
20 your view of the results indicated in this study; what
21 does it indicate?

22 A. It indicates a three to eight-fold
23 increase in amount of browse material present in the
24 herbicide treated blocks as compared to the untreated
25 blocks.

1 Q. Were any findings made or conclusions
2 reached regarding the effect of the herbicide
3 treatments on the quality of the browse present as
4 opposed to its abundance?

5 A. Well, no laboratory work was done,
6 the conclusion was based on the vigor and condition of
7 that browse material and the species present, that the
8 quality on the herbicide treated blocks was better than
9 the quality of possible browse material on the
10 untreated block.

11 I might elaborate - since, with
12 apologies, a couple of sentences that were intended to
13 be in the original manuscript somehow escaped when
14 galley proof time came along - that the species
15 representing that browse material though described
16 indirectly on page 644 in the midpoint of the right
17 column were not specified as those making up the browse
18 material, I would elaborate that the species listed
19 there are quaking aspen, red maple, paper birch - or
20 otherwise known as white birch - and red raspberry.

21 Q. And they were, I'm sorry, what; the
22 browse?

23 A. They were the principal species that
24 made up the quantities of browse material and it was
25 concluded in consultation among the group, but

1 principally through the appraisal of Mr. Lautenschlager
2 the center author, that the browse material was of
3 better quality on the herbicide treated blocks.

4 Q. The Board has received in evidence,
5 Dr. McCormack, an article by John Connor and Lorie
6 McMillan.

7 MS. CRONK: That's Exhibit, Madam Chair,
8 771B, entitled: Winter Utilization by Moose of
9 Glyphosate Treated Cut-overs, an Interim Report.

10 Q. Are you familiar with that article,
11 Dr. McCormack?

12 DR. MCCORMACK: A. Yes, I am.

13 Q. Do you have a copy of it there?

14 A. I do.

15 Q. Can you offer to the Board any
16 opinion as to the significance of the findings recorded
17 in this article and, in particular, as they compare to
18 the findings reported in your own article and that of
19 Dr. Newton, if that comparison is possible?

20 A. Yes, I can. We were at least aware
21 of the study.

22 Q. Sorry, Dr. McCormack, if I could
23 interrupt.

24 MS. CRONK: Would it assist, Mr. Martel.
25 We have extra copies here, sir. (handed)

1 MS. CRONK: Thank you, Dr. McCormack.

2 DR. McCORMACK: And I happened to have
3 been present when this was introduced as an exhibit.
4 We reviewed this and followed the work with interest
5 because of the similar objectives, and it is certainly
6 a contribution to the information on this subject, and
7 my conclusion is: There is nothing here that is that
8 much in contrast or difference to our conclusions.

9 There are a few things that personally I
10 feel need to be considered here. They are summarized
11 in part - this is on what shows on my copy as page 135
12 of the Connor and McMillan paper, Table 1 - there is
13 text which goes into more detail on this, but if you
14 refer to Table 1 you can see that looking at the study
15 sites under year harvested that there is a range of
16 years, and then also it indicates when site preparation
17 took place, and if you scan across that one can see
18 that there are different histories to each study block,
19 different dominant species present, at least in the
20 case of area No. 2 a different site preparation
21 treatment, and the mechanical site preparation occurred
22 across a range of four years, and where herbicides were
23 applied, at least in the case of area 1, a different
24 rate was applied. Also, the herbicide treatments were
25 applied in two different years.

1 Now, in the pure sense of the study, the
2 two different years of release treatment might not mean
3 much, but when one considers the potential effects of
4 weather conditions, especially over the two or three
5 weeks prior to a glyphosate treatment and how that can
6 affect efficacy, there could very well have been
7 different levels of efficacy from one year to the next.

8 Therefore, when one reviews these data
9 you have to consider the different histories and how
10 that might affect the validity of comparing one area
11 with another, as well as the potential variation which
12 is not measured in the study when you look at the
13 different dominant species present, the different site
14 preparation history and the possibility actually of
15 three different levels of efficacy from the glyphosate
16 treatment because of the two rates and because of the
17 two years. Therefore, the data are useful but must be
18 considered in light of those variables.

19 Further, it is hard for us to compare
20 these data with our data because this is a relatively
21 short-term study.

22 Now, as I understand it, this study is
23 continuing and it will be most useful when an
24 evaluation of the further development of the browse
25 material on these sites can be evaluated. Because this

1 is described as the major time period of study as being
2 two growing seasons after treatment, and all our work
3 over the past 10 to 12 years indicates that it's in the
4 year three to year four 4 that the vegetation really
5 starts to change in the most dynamic manner, and this
6 study, as reported here, has not yet reached that
7 point.

8 Q. Last week, Dr. McCormack, during the
9 proceedings of the Board a document was filed before
10 the Board, Exhibit 1177, in which reference is made to
11 the Connor and McMillan article to which I have just
12 referred you.

13 MS. CRONK: And just for the record,
14 Madam Chair, I don't think there is any need for the
15 Board to have it, unless you need it, but it was the
16 presentation by Jack Hedman filed as Exhibit 1177.

17 Q. In that document, Dr. McCormack, it
18 is suggested that the Connor and McMillan study
19 indicates that treated areas; that is, treated with the
20 chemicals referred to in the Connor and McMillan
21 report, have a negative impact on moose wintering
22 habitat as opposed to control areas.

23 In your opinion, does the Connor and
24 McMillan study establish that?

25 DR. MCCORMACK: A. It establishes it on

1 the short time period represented in the study for the
2 specific site where the observations were made, but as
3 one looks at the area of the study treatments one can't
4 assume that the habitat of a moose with the capability
5 of moving around through the site would be restricted
6 to that specific study area; therefore, that statement
7 can be made only by imposing some rather strict
8 qualifications on the data presented in this Connor and
9 McMillan paper.

10 Q. Is there anything in the Connor and
11 McMillan study which assists, Dr. McCormack, in
12 assessing what the degree of moose utilization was of
13 the control areas prior to carrying out the study?

14 A. Well, there are some observations
15 here and I'd have to -- for example, if I can just look
16 to make sure I have what I'm looking for here.

17 Okay. Table 5, for example - this is on
18 page 139 of the Connor and McMillan paper - Table 5 is
19 data described as numbers of pellet groups per
20 hectare, available biomass and utilized biomass for
21 cut-over areas 3 and 4 -- areas 3 and 4 three months
22 before spraying.

23 And looking at those data there is a
24 direct indication here of comparing the control area
25 with the treated areas with reference to pellet groups

1 per hectare that there was distinctly different level
2 of use.

3 Q. In what sense?

4 A. In that pellett groups per hectare
5 are 2.90 on the control area and 28.08 on the treated
6 areas. From that one can conclude that there was an
7 uneven amount of activity of moose on the areas before
8 treatment.

9 Q. Dr. McCormack, is the suggestion that
10 glyphosate reduced available moose browse and the
11 quality of available moose browse consistent or
12 inconsistent with the research work in which you have
13 participated?

14 A. It is inconsistent with what we have
15 measured and what we have found, but I must emphasize
16 that the time dimensions are important here.

17 Q. And what do you mean by that, sir?

18 A. We have made our observations over a
19 longer period of time, that we have gone beyond that
20 third year, fourth year point when the vegetation
21 respond with obvious vigor and development.

22 Q. In your opinion, Dr. McCormack, if
23 the abundance of browse is affected, does it
24 necessarily follow that the quality of browse is
25 similarly affected--

1 A. No.

2 Q. --by the herbicide treatment?

3 A. It does not necessarily follow. One
4 could expect that because the stand is opened up
5 somewhat and more sunlight reaches the growing
6 vegetation that it will be more vigorous and perhaps of
7 an improved quality, but one cannot jump to that
8 conclusion just because the quantity is increased.

9 Q. Dr. McCormack, have you read the
10 moose guidelines that apply in the area of the
11 undertaking as developed by the Ministry of Natural
12 Resources?

13 A. Yes, I have.

14 MS. CRONK: Madam Chair, that's Exhibit 3
15 10. I have a number of questions for Dr. McCormack
16 based on the guidelines. I wonder if the Board has a
17 copy of them available to them?

18 MADAM CHAIR: We should have them
19 memorized at this point, Ms. Cronk.

20 MS. CRONK: I should say, Madam Chair,
21 that we provided a list of the exhibits that we
22 suggested you should have, but I recognize the time was
23 limited this morning and it may not have been possible
24 to gather them altogether.

25 MADAM CHAIR: Well, it could be on this

1 desk somewhere. We have one copy, that's fine.

2 MS. CRONK: Thank you.

3 Q. Dr. McCormack, could I direct your
4 attention first, please, to an article which appears as
5 one of the appendices to the moose guidelines. It's
6 entitled: Moose Habitat in Ontario -- I'm sorry, it's
7 not, that's the wrong one. It's in Appendix 4 and it's
8 entitled: Effects of Forestry Practices on Ungulate
9 Populations in the Boreal/Mixed Wood Forest. Do you
10 have that?

11 DR. McCORMACK: A. I have that one.

12 Q. And are you familiar with the
13 contents of that article?

14 A. Yes, I am.

15 Q. Could I ask you to go to page 31,
16 please, and I would direct your attention to the first
17 full paragraph appearing in the right column on page
18 31. Do you have that?

19 A. Yes. Yes, I do.

20 Q. Well, I would ask you to take a
21 moment just to read that paragraph to yourself, if you
22 would, Dr. McCormack, and then indicate to the Board,
23 if you are in a position to do so, whether you agree or
24 disagree with the suggestion contained in that
25 paragraph that herbicides are used for the purposes

1 described in that paragraph?

2 A. Yes. I may be out of order, but I
3 guess I should explain a little bit why I kind of
4 smiled when this came up.

5 It was on the occasion of my last visit
6 here in Toronto two weeks ago, I went down to the
7 government bookshop and I saw this on the shelf and
8 bought it thinking I will read it on the way home, and
9 it was just a coincidence that I happened to read this.

10 This paragraph relates to:

11 "A less common use of herbicides is for
12 stand conversion where all deciduous
13 competition in a mixed wood stand is
14 killed through repeated applications of
15 herbicides or where mixed wood cut-over
16 sites are completely sterilized with
17 herbicides before conifers are planted."

18 I was surprised to see that because I
19 think with the current herbicide technology, first,
20 repeated applications are unlikely in a case like this
21 because it's not necessary, and because the cost would
22 be prohibitive but, even more so, the term sterilized
23 here is inappropriate, chemically impossible and, thus,
24 impossible to be a result of a stand conversion; or
25 even if someone did carry out repeated applications of

1 the herbicides that would be used for this purpose,
2 sterilization would not be possible because there
3 are -- from these herbicides, there are no residual
4 activities from these herbicides, all living organisms
5 and all plant material is never totally removed from
6 the site and, as I understand the term sterilization,
7 it just flat out isn't possible with the technology
8 that would be used in this manner, and economics and
9 just reasonable management considerations would
10 preclude the concept of repeated applications.

11 Q. Could I ask you to go to page 5 as
12 well, this time of the guidelines themselves, please,
13 Dr. McCormack.

14 A. Okay.

15 Q. And I'm directing your attention to,
16 again the right-hand column, this time the second full
17 paragraph.

18 A. I have it. The one that begins:
19 "The effective chemical site preparation
20 depends largely on the chemical being
21 used."

22 Q. Yes. Do you agree or disagree with
23 the proposition contained in that paragraph with
24 respect to the application of glyphosate to kill
25 herbaceous and woody plants, and the use of -- the

1 effect of glyphosate as suggested in this paragraph of
2 substantially reducing browse species for an extended
3 period?

4 A. Okay. This is the latter half of
5 that paragraph which starts off with:

6 "Recently approved chemicals such as..."?

7 Q. Yes?

8 A. "...Roundup or Vision...", and so
9 forth?

10 Q. Yes.

11 A. And states that:

12 "Killing herbaceous and woody plants
13 may substantially reduce browse
14 species for an extended period of time."

15 Well, this of course depends on the
16 definition of extended period of time. There certainly
17 what our data and Connor and McMillan have shown there
18 is a change over a period of two years, maybe up to
19 three years, but beyond that, if beyond that, two to
20 three-year period is extended period of time, then no,
21 this statement is not correct.

22 It would be dependent on the amount of
23 material applied and, if I may, I would like to point
24 out that when we consider herbicide applications, as I
25 tried to illustrate when I had the box in here two

1 weeks ago, one herbicide application is not necessarily
2 like another herbicide application; for example, three
3 litres per hectare of Vision versus four or five or six
4 litres on a given site could give completely -- or
5 greatly different results because of the varying levels
6 of efficacy. Thus, to say glyphosate is going to do
7 this is an oversimplification.

8 Three litres per hectare of Vision is not
9 going to approach this in any way if there is any
10 reasonable amount of vegetation there. One could go to
11 an extreme and say one litre per hectare we'd be hard
12 pressed to know the material was even applied.

13 So what I'm trying to describe here is,
14 there is an infinite number of conditions that could
15 exist following a glyphosate application and if the
16 manager prescribes properly, to get an adequate level
17 of suppression then this type of condition which is
18 described here is not going to happen.

19 Q. Thank you, Dr. McCormack. At the
20 scoping session held with respect to this panel, before
21 you and your colleagues on the panel commenced your
22 evidence, a number of questions were raised having to
23 do with the costs of chemical tending treatments in
24 comparison to the costs of various other forms of
25 tending treatments, and I would refer you to the final

1 overhead that has now been marked as Exhibit 1185.

2 And could you outline for the Board,
3 please, your understanding and your experience, the
4 relative costs of the types of tending treatments dealt
5 with in that overhead?

6 A. Okay. What I have tried to do with
7 this overhead which is in two parts - which didn't end
8 up fitting all on the one page - was to summarize some
9 costs of tending treatments specifically on this table
10 comparing manual treatments with chemical, meaning
11 herbicide treatments, from different locations or
12 jurisdictions, starting with some 1978 dollar U.S.
13 figures, working down through some manual cost data
14 from New Brunswick, manual cost data from Quebec,
15 information which was summarized by MNR, and then
16 numbers provided by the industry, comparing manual
17 costs per hectare with chemical costs per hectare. And
18 it's a matter of comparing the dollars on the left-hand
19 column with those which are immediately to the right.

20 For example, at the top it shows in the
21 1978 dollar figures to manually treat one hectare would
22 have cost \$247 and with those same dollar values to
23 treat a hectare with herbicide would have cost \$37.

24 The high cost of manual treatments shown
25 from New Brunswick and Quebec range as high as \$630 per

1 hectare in New Brunswick - those are for 1985 and '86 -
2 and as high as \$1,000 per hectare in data from Quebec.
3 Those are represented as 1989 dollars.

4 The Ontario values have already been
5 presented as evidence, MNR Panel 12 page 158, and they
6 show, for example, \$400 per hectare per entry for
7 manual. I should point out that these values on the
8 manual treatment are per entry and in many cases to get
9 the needed silvicultural effectiveness at least a
10 second entry is necessary.

11 \$400 dollars per hectare MNR value, and
12 they have broken down their aerial application of
13 herbicide costs for 2,4-D, \$40 per hectare; for
14 glyphosate, \$135 per hectare; for ground application of
15 2,4-D, \$150; and for ground application of glyphosate,
16 a range of \$200 to \$300.

17 The OFIA figures as shown at the bottom
18 of this page relate to FMA compensation rates. The
19 manual tending ranges from \$175 to \$450 per hectare per
20 entry; the herbicide treatments range from \$44.22 up to
21 just slightly over \$147 per hectare. Actual costs for
22 manual tending are also shown and they range from \$200
23 to \$625 per hectare per entry.

24 The remaining tale on this table,
25 following the same format, continuing on the costs of

1 Have you ever in your personal experience
2 experienced a situation where the costs of manual
3 tending treatments were less than the costs of a
4 parallel herbicide treatment?

5 A. Nothing that I can think of. I don't
6 recall a single case.

7 Q. Thank you, very much.

8 A. Okay.

9 Q. Mr. Tomchik, if I could turn now to
10 you, please, to deal with another area before the
11 Board.

12 One of the issues raised by the Industry
13 in this statement of evidence concerns what the
14 Industry has described as the need for additional
15 research and development concerning herbicides. I
16 understand that you will be outlining for the Board the
17 nature of the Industry's position and the basis for it
18 in that regard; is that correct?

19 MR. TOMCHIK: A. That's correct. If I
20 can just have a moment to get the slide projector
21 ready.

22 Madam Chair, Mr. Martel, as outlined by
23 Dr. McCormack and as indicated in our statement of
24 evidence in Section 4.7 it is the Industry's position
25 that the use of authorized herbicides is essential to

1 various tending treatments, are some summary figures
2 for 1989 from the State of Maine where some relatively
3 large private industry operations have been underway
4 for several years.

5 The cost - I'm going to have to correct
6 this, I just caught an omission - the cost of manual
7 per entry to treat a hectare is \$500 plus or minus
8 \$100, meaning it would be a range of from \$400 to \$600
9 per hectare per entry. I'm sorry for that error due to
10 the omission of the minus sign.

11 Chemical treatments are broken down for
12 glyphosate and 2,4-D, though very little area has been
13 treated with 2,4-D in developing these figures.
14 Glyphosate as Roundup is applied for somewhere between
15 \$100 and \$136 per hectare - this is for the most part
16 rotary wing application aerial - and for 2,4-D it would
17 range from \$65 to \$75 per hectare.

18 So from these numbers one can get a
19 fairly good range of what the costs are to carry out
20 the tending but also to get a comparison between the
21 manual option and the herbicide option, though most of
22 the herbicide numbers are based on aerial application.

23 Q. Dr. McCormack, one final question on
24 this area and then I am going to invite you to take a
25 rest while I turn to one of your colleagues.

1 achieve vegetation control in the context of timber
2 management.

3 Further to this, the OFIA/OLMA endorses
4 and supports the need for research, development and
5 registration of additional herbicides. Our position in
6 this regard is as follows:

7 Research, development and registration of
8 additional herbicides for use in timber management in
9 the area of the undertaking, as well as alternative
10 vegetation management techniques, must be supported and
11 encouraged. We need this research, development and
12 registration of additional herbicides because at the
13 present time only three herbicides; namely Vision,
14 Velpar, and 2,4-D are registered for forestry use in
15 Canada and are of value in tending operations. velpar
16 is restricted to ground application only.

17 There are, however, other herbicides
18 which can be used for forestry purposes, for example,
19 crenite and Garlon and, in fact, these herbicides have
20 been registered for such use in the United States. Any
21 necessary research and development leading to the
22 registration of these, and hopefully other additional
23 herbicides, is essential.

24 The current limited number of herbicides
25 for use in forestry applications in Ontario has several

1 consequences including: for some weed species there
2 are no effective herbicides registered; for some other
3 weed species the control is limited with the available
4 herbicides; the options available to timber managers
5 for the effective management and protection of the
6 forest is, therefore, limited; it contributes to the
7 backlog of non-productive forestlands and to existing
8 weed problems; it renders timber managers vulnerable to
9 loss of effective management options should one or more
10 currently available herbicides be made unavailable; it
11 prohibits the timber manager from prescribing specific
12 levels of vegetation management; and, in terms of
13 pricing and availability, timber managers are at the
14 mercy of the few manufacturers supplying forestry
15 herbicides with no effective alternatives.

16 It is the Industry's view that the need
17 for additional herbicides for forestry use is clear and
18 research, development and registration of additional
19 herbicides is essential.

20 Some of the results that we would like to
21 see through such research and development would not
22 only address the consequences just mentioned on the
23 last slide, but would also hopefully result in safer
24 and more effective application systems; more finesse in
25 prescribing treatment options; and more effective

1 herbicide products which, at the same time, are cheaper
2 and potentially more acceptable.

3 It is clear to the Industry that the
4 search for new herbicides and use application
5 technology should be supported and encouraged. This
6 position is supported by others including the Forest
7 Pest Management Institute of the Canadian Forestry
8 Service, now known as Forestry Canada, the Task Force
9 on Forest Management Agreements, Canadian Council of
10 Resource and Environment Ministers, known as the CCREM,
11 the Canadian Council of Forest Ministers, current
12 federal and provincial pesticide registration and
13 approval for use processes, the Ontario Ministry of
14 Natural Resources, and as well corporate and
15 professional responsibility and policies.

16 The Forest Pest Management Institute of
17 the Canadian Forestry Service in their 1988-89 program
18 plan stated that, and this is a quote:

19 "Although herbicides are not the only
20 tool for controlling unwanted vegetation,
21 they are the most practical tool
22 currently available to foresters.

23 Herbicides provide foresters with a
24 timely, cost-effective and safe tool for
25 controlling unwanted weed species in

1 forestry. Only three herbicides, Roundup
2 Velpar and 2,4-D are registered for
3 forestry use in Canada. Currently Velpar
4 is restricted to ground applications.
5 The lack of forestry herbicides has and
6 is contributing significantly to Canada's
7 significant weed crop problem and backlog
8 of non-productive forestland."

9 The Canadian Forestry Service also
10 identified the following related program in that
11 program plan.

12 "Growth and proliferation of unwanted
13 vegetation (weeds) is a serious problem
14 in conifer plantations. Not only do
15 these weeds compete for resources (light,
16 nutrients, moisture and space) against
17 the crop plants, but they also prolong
18 the rotation cycle and reduce the quality
19 and quantity of timber. Vegetation
20 management is essential and chemical
21 herbicides are currently the most
22 efficient and cost-effective tools for
23 the forest weed management.
24 However, very few herbicides are
25 registered for forestry use in Canada

1 and the use of some of these have become
2 controversial in the public viewpoint.
3 For some weed species no effective
4 herbicides are registered for their
5 control or the ones that are registered
6 are not very effective. Consequently a
7 continuous research program is necessary
8 to provide a greater selection of
9 products for use against forest weeds."

10 The Forest Pest Management Institute has
11 taken some action in recognition of the need to assist
12 in the registration of operational use of additional
13 herbicides. This action included the formulation of a
14 number of research projects in the past designed to
15 assist herbicide registration research. Some of the
16 projects were specifically intended to assess the
17 efficacy and crop tolerance of new herbicides and to
18 develop new and improved use strategies for forestry
19 herbicides that provide maximum crop tree growth
20 response with minimal environmental impact.

21 The second authority that we can see that
22 supports the need for research, development and
23 registration of additional herbicides is the Task Force
24 on Forest Management Agreements. This task force was
25 struck as a result of an MNR/Industry initiative in

1 1987 with the mandate to solicit input, identify
2 problems and make recommendations respecting the forest
3 management agreements and their administration. The
4 report of the Task Force on Forest Management
5 Agreements has been previously filed as Exhibit No.
6 940.

7 On page 29 of that report regarding
8 herbicides, the following statement is made:

9 "Many company and MNR personnel in their
10 briefs to the Task Force stated the need
11 for more registered herbicides for
12 forestry purposes, something strongly
13 endorsed by this Task Force."

14 The fourth agency I will mention that
15 endorses the need for research, development and
16 registration of additional herbicides - I'm sorry. The
17 Task Force on Forest Management Agreements goes on to
18 say:

19 "Only two herbicides (2,4-D and
20 glyphosate) are presently registered for
21 aerial application. Competition control
22 is essential to timber production on
23 productive sites and aerial herbicide
24 operations are the only effective means
25 of competition control in most northern

1 Ontario situations."

2 Another authority to recognize the need
3 for research, development and registration of
4 additional herbicides is the Canadian Council of Resource
5 and Environment Ministers known as the CCREM.

6 This group created the Task Force of
7 Provincial and Federal Forestry and Environmental
8 officials as a response to a recognized problem with
9 insufficient number of pesticides required for the
10 forestry sector to carry out its forest renewal and
11 protection responsibilities.

12 The CCREM directed the Task Force to work
13 co-operatively to expedite the registration of several
14 high priority pesticides as identified by forestry
15 agencies, partly through the work of this CCREM Task
16 Force, a new formulation of the microbial insecticide
17 B.t. was registered as well as the herbicide Roundup.
18 However, attempts to register other extremely useful
19 herbicides, including Velpar, Garlon and crenite were
20 less successful.

21 Velpar was granted a ground only
22 registration; Garlon is still not registered in Canada,
23 and crenite did at one time have a temporary
24 registration in British Columbia for conifer release
25 but it is not registered now. All of these herbicides

1 are registered for forestry use in the United States.

2 The CCREM Task Force on Pesticides in
3 Forest Management also describe Canadian pesticide
4 registration requirements as being among the most
5 demanding in the world and steadily becoming more
6 stringent.

7 The fourth agency I will mention that
8 endorsed the need for research, development and
9 registration of additional herbicides is the Canadian
10 Council of Forest Ministers. In 1987 this group
11 developed the National Forest Sector Strategy for
12 Canada. This document has been previously filed as
13 Exhibit No. 589. On page 7 the strategy states:

14 "Much of Canada's forest is overmature
15 and requires protection from fires,
16 insects and disease so that its inherent
17 value can be utilized over time.
18 Investments in new forests must be
19 protected from hazards including
20 competing weeds. Failure to invest in
21 protection will jeopardize future
22 benefits from the forest. Furthermore,
23 the level of protection should be
24 appropriate to the value of the resource
25 and the level of investment in its

1 management."

2 Dean Carrow in his evidence regarding the
3 need for research, development and registration of
4 additional insect control agents has referred to the
5 CCREM and the CCFM and its related National Forest
6 Sector Strategy. His evidence in respect of these
7 councils, as well as his evidence regarding the
8 registration process, is also in respect for the need
9 for additional research and development of herbicides,
10 in that in the context of forest management pesticides
11 does include herbicides.

12 It is clear that the use of herbicides
13 for timber management is both appropriate and
14 necessary; furthermore, it is clear that additional
15 herbicides are also appropriate and necessary. It is
16 the Industry's position that such research and
17 development for the registration of additional
18 herbicides is both necessary and critical and that it
19 should be so acknowledged, supported and encouraged.

20 Regarding the pesticide registration
21 processes, which also supports our position in this
22 matter, the Board has heard evidence from Dr. Ritter
23 regarding the complexities of the current federal
24 pesticide registration process. Also, as previously
25 stated, the CCREM described Canadian pesticide

1 registration requirements as being among the most
2 demanding in the world.

3 In the Industry's view the current system
4 is most responsive to environmental and health
5 concerns. Prior to registration and authorization for
6 use of any herbicides, extensive scientific and
7 government review and detailed consideration of
8 potential adverse environmental and health impacts are
9 undertaken. It is the position of the Industry that
10 the current federal and provincial pesticide
11 registration and approval for use processes constitute
12 an effective and reasonable approach to control the use
13 of pesticides, including herbicides.

14 There are some consequences, however, of
15 the current regulatory framework and there is a process
16 in place whereby the current registration process is
17 being reviewed and will eventually be analysed and
18 recommendations for change be made. This is the
19 pesticide registration review process.

20 Dean Carrow has given evidence on this.
21 It is interesting to note that the federal pesticide
22 registration review team has recognized the urgent need
23 to expedite the research and development of new pest
24 control technology.

25 As I mentioned, there are however some

1 consequences of the current regulatory framework as it
2 applies to the registration of additional herbicides.
3 A serious commitment of investment and investment of
4 time, finances and other resources are required of
5 pesticide manufacturers in order to comply with the
6 regulations of the registration process.

7 The economic consequences of the lengthy
8 and elaborate registration and approval system when
9 compounded with the limited forestry markets act as a
10 deterrent to the continuing research and development of
11 potential additional herbicides for timber management.

12 As a result of all this we are left with
13 a severely limited number of herbicides available for
14 use which in turn impedes tending and protection
15 measures and limits the ability of timber managers to
16 respond to evolving forest conditions in a timely and
17 effective manner.

18 The Ontario Ministry of Natural Resources
19 have also recognized the need for research, development
20 and registration of additional herbicides. As
21 mentioned earlier, the FMA Task Force report indicated
22 that many MNR personnel stated the need for more
23 registered herbicides for forestry purposes.

24 In its presentation of evidence,
25 specifically in panel 12, the Ontario Ministry of

1 Natural Resources again endorsed and supported the need
2 for research, development and registration of
3 additional herbicides.

4 During their evidence presentation, both
5 Dr. Campbell and Mr. Galloway stated that it was their
6 preference as professional foresters to have available
7 as a tool to treat lands more suitable herbicides than
8 currently exist. In fact, Mr. Galloway went on to say:

9 "The continued research and development
10 should occur with respect to more
11 suitable herbicides."

12 Also Dr. Campbell agreed that the
13 position of the MNR was that a commitment should be
14 made to continuing research and development for
15 herbicides suitable for use in forestry applications in
16 the area of the undertaking.

17 The Industry supports and encourages
18 MNR's commitment to such continuing research and
19 development and indeed feels that this work is
20 essential.

21 Finally, the companies and individuals
22 involved in timber management and are represented by
23 the OFIA/OLMA have committed themselves to supporting
24 and encouraging the continued research and development
25 of timber management techniques and procedures,

1 including the use and registration of herbicides.

2 The OFIA, for example, in their Statement
3 of Environmental Policy, which is Exhibit 1039,
4 indicates that:

5 "Member companies will conduct tending in
6 an environmentally sound manner and will
7 encourage and support research to develop
8 environmentally sound techniques,
9 processes and practices."

10 Abitibi-Price's Forest Management Policy
11 contained in Exhibit No. 1034 specifies that:

12 "The safe use of government approved
13 herbicides is an integral and necessary
14 part of forest management and that the
15 development of better methods and
16 procedures through well planned and
17 co-ordinated research programs is
18 essential."

19 Other examples of policy or principle
20 that shows that the Industry has committed itself to
21 research and development with respect to timber
22 management in general, including herbicides in tending,
23 are the CPPA's Environmental Statement, the Statement
24 of Policy for E.B. Eddy Forest Products Forest
25 Management, and Quebec & Ontario Paper's Forest

1 Management Objectives and Guiding Principles for our
2 Ontario Woodlands operations.

3 MS. CRONK: Q. Mr. Tomchik, if I could
4 interrupt you there.

5 MS. CRONK: Madam Chair, a number of
6 these statements have been marked in evidence as Mr.
7 Tomchick indicated, but a number have not and I would
8 like to tender the balance as exhibits for the Board.

9 MADAM CHAIR: Under one exhibit number,
10 Ms. Cronk?

11 MS. CRONK: I think it would be
12 preferable, Madam Chair, to mark them separately if,
13 that's acceptable.

14 MADAM CHAIR: All right. The first one
15 will be Exhibit 1189.

16 MS. CRONK: That's the Statement of
17 Policy for E.B. Eddy Forest Products Limited on Forest
18 Management. (handed)

19 ---EXHIBIT NO. 1189: E.B. Eddy Forest Products Limited
20 Statement of Policy on Forest
Management.

21 MADAM CHAIR: Exhibit 1190.

22 MS. CRONK: I wonder if the next could be
23 the Environmental Statement that Mr. Tomchik has
24 referred to by the Canadian Pulp & Paper Industry.

25 MADAM CHAIR: That's Exhibit 1190.

1 MS. CRONK: (handed)

2 ---EXHIBIT NO. 1190: Canadian Pulp & Paper Association
3 Environmental Statement.

4 MS. CRONK: And then, thirdly, Madam
5 Chair, is the Forest Management Objectives and Policy
6 Statement by the Ontario Woodlands Operations Division
7 of Quebec & Ontario Paper Company Limited. (handed)

8 MADAM CHAIR: That's exhibit 1191.

9 ---EXHIBIT NO. 1191: Forest Management Objectives and
10 Policy Statement of the Ontari
11 Woodlands Operations Division of
the Quebec & Ontario Paper
Company Limited.

12 MS. CRONK: Q. Mr. Tomchik, does that
13 complete the list of the organizations and professional
14 associations who, insofar as you are aware, have
15 endorsed the need for additional research for research
16 and development of addition herbicides.

17 MR. TOMCHICK: A. That's correct, Ms.
18 Cronk. I would like to mention as well, most of our
19 companies and individuals involved with timber
20 management for that matter have a philosophy of
21 continuous improvement of quality of work of product.

22 Research and development into new
23 processes and techniques are inherent and ongoing and
24 an essential part of this philosophy.

25 Q. Mr. Stanclik, could I perhaps ask you

1 to turn the lights on, please.

2 Mr. Tomchik, again on this entire issue
3 of research and development and the need for that kind
4 of work to be done with respect to herbicides, the
5 question was raised at the scoping session with respect
6 to this panel concerning the involvement of the
7 Industry in research and development with respect to
8 growth and yield data.

9 And perhaps we could start generally, and
10 could I ask you to outline for the Board, if you would
11 please, what the involvement of the Industry is in
12 research and development generally and then to comment
13 on its involvement with respect to tending?

14 A. Tending, or growth and yield?

15 Q. Generally first, and then growth and
16 yield, if you wish.

17 A. The forest industry in Ontario
18 contributes both in dollars and in kind in many ways.
19 I guess starting at the top, if you will, under the
20 auspices of Forestry Canada, the Forest Research
21 Advisory Council of Canada, or FRACC, basically
22 recommends forest direction and level to the regional
23 forest research centres across Canada, such as the
24 Great Lakes Forest Centre and the Petawawa National
25 Forestry Institute and the Forest Pest Management

1 Institute.

2 This Council identifies provincial
3 forestry research institute -- or issues and perhaps
4 and compares them with federal research centres'
5 programs. They have a direct impact on the level of
6 funding and the program direction of those regional
7 centres. Funding for those centres generally come from
8 the federal/provincial revenues from public and
9 corporate taxes.

10 Q. Sorry, what was the name of that
11 group again?

12 A. That is the Forest Research Advisory
13 Council of Canada, known as FRACC. FRACC reports
14 annually to the Canadian Council of Forest Ministers
15 and advises them of federal research accomplishments,
16 issues and plans generally -- and generally provide
17 feedback on a national scope.

18 Currently Mike Innes of Abitibi-Price is
19 the Chairman of FRACC. Mr. Innes has testified on the
20 Industry's planning overview panel and will be
21 testifying again in Panel 10, planning.

22 At the provincial level, there is the
23 Ontario Forestry Council which was established in 1984
24 to recommend priorities in funding for forest research.
25 It's mandate was enlarged in 1986 to co-ordinate all

1 forestry research in Ontario, and the Council is made
2 up of members from federal and provincial governments,
3 universities and major forest products companies.

4 The Ontario Forestry Council identifies
5 needs, makes recommendations about research, and
6 reviews research activities. Minimal funding is
7 required for the Council itself as they do not carry
8 out the actual research.

9 Under the Ontario Forestry Council is the
10 Ontario Forestry Research Committee or the OFRC which
11 was formed in 1987 by the Ontario Forestry Council in
12 order to have a single forest research advisory body
13 for Ontario with the intent to have a committee with
14 equal representation of the doers and users of forest
15 research.

16 Q. What do you mean by the phrase, doers
17 and users in research?

18 A. The people who are carrying out the
19 research and the people who are using the results of
20 the research.

21 The OFRC develops research priorities for
22 the Ontario Forestry Council's consideration, and
23 members on the research committee include OMNR, Great
24 Lakes Forestry Centre, forest industry, the Ontario
25 Tree Improvement Council, and forestry universities.

1 The OFRC currently is chaired by Ted Boswell of E.B.
2 Eddy who is the vice-chairman of the Ontario Forestry
3 Council.

4 OFRC members from OFIA include Ted
5 Boswell, Mike Innes of Abitibi, Bill Brown of the
6 Algonquin Forestry Authority and Rosemary Rauter and
7 John Iverson of Domtar.

8 All subcommittees of the OFRC have
9 industry participation, several have industry chairs,
10 they include Rosemary Rauter of OFIA, who chairs the
11 tree seed stock production and forest genetic
12 subcommittee; Mike Innes chairs the tending
13 subcommittee; and Bill Brown chairs the resource
14 allocation inventory growth and yield subcommittee.

15 The other -- there are six subcommittees
16 with three others on the OFRC, are regeneration
17 protection and environmental impacts. Again, funding
18 for the OFRC is minimal in that they do not carry out
19 the actual research.

20 Again, under the Ontario Forestry Council
21 is the Ontario Forest Institute or OFRI. Currently
22 this is an OMNR organization involved with, in part,
23 the allocation of funding for forestry research which
24 is currently a provincial budget item.

25 The OFRC has recommended that interested

1 parties move as quickly as possible towards the
2 establishment of a body to replace the existing Forest
3 Research Institute of the OMNR. This recommendation
4 was unanimously agreed to by the OMNR, the Canadian
5 Forestry Service, and the university and forest
6 industry members on the Ontario Forestry Council.

7 With the new proposed Ontario Forest
8 Research Institute direct financial support would come
9 from OMNR and the forest industry. There are other
10 research bodies that the Industry contributes directly
11 to in terms of dollars. These would include FERIC, the
12 Forest Engineering Research Institute of Canada. It is
13 estimated that in 1990 approximately \$3-million will be
14 contributed to FERIC from Canadian forest products
15 industries.

16 There is also the PPRIC which is the Pulp
17 and Paper Research Institute of Canada, and FORINTEK,
18 which is Canada's woods products research institute.

19 As well, Industry supports chairs at
20 several universities. For example, Abitibi-Price
21 surprising supports the pulp and paper chair at the
22 University of Toronto and is one of the contributors to
23 the forest policy chair at UBC.

24 Industry also participates on a number of
25 advisory committees which are directed to forestry

1 research. For example, Nick Saltarelli of
2 Abitibi-Price and John Iverson of Domtar are on the
3 Great Lakes Forestry Centre Advisory Committee, and
4 Mike Innes of Abitibi and Bill Brown of the Algonquin
5 Forestry Authority are on the Forest Research Advisory
6 Council, or FRACC, which I had mentioned.

7 Industry also makes contributions in
8 kind, generally in association with other agencies. On
9 behalf of my company, Quebec & Ontario Paper, we have
10 carried out herbicide screening trials with the
11 Ministry of Natural Resources, we have participated in
12 a Garlon soil percolation trial with Dow Chemical,
13 we've participated in Bracke herbicider trials with the
14 Ministry of Natural Resources and KDM Forestry
15 Consultants, and we are also a member of the Ontario
16 Tree Improvement Council, and with respect to
17 alternative vegetation management techniques, we are
18 currently carrying out a trial where we are using
19 mechanical mulching techniques such as chips, used
20 paper machine felts, plastic to control competing
21 vegetation in our seed orchards established through the
22 Ontario Tree Improvement Council.

23 Canadian Pacific Forest Products have
24 carried out direct seeding trials with Forestry Canada;
25 E.B. Eddy has carried out operational trials with using

1 Velpar with the Ministry of Natural Resources, and they
2 have also participated in an interesting trial to
3 measure the effects of different levels of site
4 preparation in competition control on growth
5 interactions of several species in terms of
6 temperature, nutrients and light, and this was carried
7 out in conjunction with Forestry Canada.

8 As well - and you have heard evidence
9 before on this in harvesting and renewal - there are
10 informal trials carried out on an ongoing basis, and on
11 behalf of Ontario Paper, we have carried out hand
12 tending and spot done application trials with Velpar
13 and several other trials -- operational trials of that
14 nature.

15 MS. CRONK: Q. Just dealing with those
16 for a moment, Mr. Tomchik, and those that you have
17 described, can you provide the Board with an example of
18 those that you have outlined that specifically relate
19 to research and development on growth and yield data
20 from the use of herbicides?

21 MR. TOMCHICK: A. Well, the best one
22 that I can think of is the one that's carried out on
23 E.B. Eddy's Pineland Forest with Forestry Canada, which
24 I had mentioned. It's measuring the effects of
25 different levels of site preparation in competition

1 control on growth interaction of several species --
2 several crop species. That is one I can think of right
3 now.

4 Also, all companies -- forestry companies
5 in their plantation assessment programs indirectly
6 carry out growth -- or gather growth and yield data
7 when they do plantation survival assessments.
8 Routinely height measurements are taken and -- which
9 include tended and untended areas, and these indirectly
10 give a body of information that could be used for
11 growth and yield studies.

12 These were several different ways by
13 which Industry contributes both financially and in
14 kind.

15 MS. CRONK: Madam Chair, I am conscious
16 of the time, and I don't know if the Board wishes to
17 take its break now. I will complete evidence-in-chief
18 within half an hour, but it will be half an hour.

19 MADAM CHAIR: All right. Why don't we
20 take a break now, Ms. Cronk.

21 MS. CRONK: Thank you.

22 MADAM CHAIR: We will be back at twenty
23 after three.

24 MS. CRONK: Thank you.

25 If the Board would care to leave its

1 tending books here, we will clip those revised tables
2 in the books for you.

3 MADAM CHAIR: Thank you.

4 ---On recessing at 3:00 p.m.

5 ---On resuming at 3:20 p.m.

6 MADAM CHAIR: Please be seated.

7 Ms. Cronk?

8 MS. CRONK: Thank you.

9 Q. Dean Carrow, if I could direct my
10 next question to you. While we are on the subject of
11 research and development and the Industry's perspective
12 on the need for certain types of research and
13 development in the future, in reviewing the transcript
14 of your evidence-in-chief in your first appearance
15 before the Board, a question and answer is recorded to
16 which I would like to return and ask you a number of
17 additional questions, if I could.

18 This appears, Madam Chair, Mr. Martel at
19 Volume 196 and, for the record, it's at the bottom --
20 commencing at the bottom of page 34,844.

21 The question reads as follows:

22 "Given what you have said, Dean Carrow,
23 regarding the need for research and
24 development of insect control agents, and
25 I am looking at the overhead that you now

1 have before the Board, given your views
2 in that regard, if research were directed
3 in the future towards new strains of
4 biological, viral insecticides, would
5 there still be a need in your opinion for
6 research and development concerning new
7 chemical insect control agents?"

8 And your answer, Dean Carrow, was rather
9 lengthy, but it began in this way:

10 "Yes, I think most certainly there would
11 be a need. I think one of the -- I guess
12 there are two promising areas of
13 technology for insect control..." and
14 you went on to talk about the general research area
15 involving biological agents or organisms, and then a
16 second general area which you described as involving
17 biochemicals and you said that that meant naturally
18 occurring chemicals that modified the behaviour or the
19 physiology of insects.

20 Now, with respect to your evidence in
21 that regard, quite apart from research and development
22 and the opportunity for research and development
23 concerning naturally occurring chemicals, is there, in
24 your opinion, a need for research and development at
25 the present time concerning additional chemical insect

1 control agents which are not naturally occurring?

2 DEAN CARROW: A. Yes, I think it would
3 be inappropriate to leave the impression with the Board
4 that the only area of promising research with respect
5 to chemicals, in fact, is biochemical itself.

6 I think we are at a stage now in insect
7 control, research and development technology where one
8 is hardpressed to predict what the scientist might
9 uncover with respect to new approaches to insect
10 control and insect management techniques.

11 Certainly the area of natural occurring
12 chemicals opens up a whole new field of research and,
13 in fact, many of the currently registered insecticides
14 that we use now have their origins in natural occurring
15 chemicals.

16 So I think it would be inappropriate, Ms.
17 Cronk, to leave the impression that research with
18 respect to insect control technology should be
19 restricted to any particular technology.

20 In my own view, I think perhaps the
21 guiding principle that is of most use to us in the
22 present time is the one that has been identified by the
23 Federal Pesticide Registration Review Team, which Mr.
24 Tomchick referred to earlier in his evidence. And one
25 of the principles that that registration review team is

1 ...operating under right now is that they have recognized
2 that there is inadequate pest control technology that
3 goes beyond insects, so it really applies to both
4 plants and -- I'm sorry, competing vegetation and
5 insects and other forms of pests.

6 But the one guiding principle that they
7 have entrenched in their discussions, I guess, is that
8 there should be active research and development
9 undertaken to increase the availability of new pest
10 control technology that has the potential to reduce
11 risk to the health and the environment; in other words,
12 without further restricting that type of research,
13 simply to take the position that if that particular
14 technology appears to have the potential of being less
15 hazardous to health or the environment, then that type
16 of research should be encouraged as opposed to over and
17 above -- in preference to other types of research.

18 Q. The next question that appears in the
19 transcript, Dean Carrow, read as follows:

20 "If it were suggested at this hearing
21 that future research and development
22 efforts should be concentrated, either
23 primarily or exclusively, on biological
24 insect control agents, would that --
25 given your experience, would the need for

1 protection in the area of the undertaking
2 be appropriate or inappropriate?

3 Now stopping there for a moment. I
4 confess, Dean Carrow, if that's an accurate rendition
5 of the question I was clearly having a bad half hour or
6 a bad day. I would like to restate the question And
7 ask you again for your opinion.

8 The proposition that I intended to put to
9 you was this: That if it were suggested at this
10 hearing that future research and development efforts
11 should exclude research and development into
12 non-naturally occurring chemicals with respect to
13 insect control agents, would you regard that as
14 appropriate or inappropriate?

15 A. No, I think that would be highly
16 inappropriate. I think in essence you are trying to
17 prejudge what the possible outcomes of our outcomes of
18 new scientific research are and I think that's a very
19 dangerous approach to take in the sense, as I said in
20 my earlier response, there are a lot of new
21 technologies emerging and it's truly an evolutionary
22 process as new classes of insect control materials
23 become available and, in fact, new tactics for insect
24 control become available.

25 Q. Thank you for clarifying that. The

1 last matter, gentlemen, that I wish to have you comment
2 upon for the Board concerns the terms and conditions
3 proposed by the Ministry of Natural Resources related
4 both to tending and protection.

5 If I could deal first with those related
6 to tending and turn to you, Mr. Tomchick. First, are
7 you familiar with the terms and conditions that have
8 been proposed by the MNR regarding tending?

9 MR. TOMCHICK: A. Yes, I am.

10 Q. Could you outline for the Board, if
11 you would, please, those terms and conditions related
12 to tending as proposed by the Ministry of Natural
13 Resources which the Industry regards as significant in
14 the sense of the Industry taking a position on those
15 terms and conditions, and outline what the term and
16 condition is and what the position of the Industry is,
17 if you would, please?

18 A. Certainly. MNR term and condition
19 No. 8 under Report of Past Forest Operations states
20 that:

21 "The area tended and area treated for
22 protection purposes will be included in a
23 summary of plan versus actual information
24 in a report of past forest operations."

25 The Industry supports this term and condition.

1 -- Under Planning of Access Harvest, Renewal
2 and Tending operations, MNR term and condition No. 11,
3 which states that:

4 "MNR shall ensure that the silvicultural
5 groundrules shall include a description
6 by site type of projected tending
7 requirements."

8 That's 11(d). Industry also supports
9 this term and condition.

10 MNR term and condition No. 12 which
11 states that:

12 "Each timber management plan contains a
13 forecast of the level of activity for
14 renewal and maintenance operations..."

15 Industry supports this term and
16 condition.

17 Under Annual Work Schedules, MNR term and
18 condition No. 32, which states that:

19 "All timber management activities with
20 the exception of..." tending -- sorry,
21 "...with the exception of protection
22 operations should be identified in
23 an approved timber management plan or
24 in an approved amendment."

25 Industry supports this term and

1 condition.

2 Under Monitoring, MNR term and condition
3 No. 50, which states that:

4 "MNR shall continue to maintain central
5 records on pesticides used for timber
6 management purposes on Crown lands in
7 Ontario", Industry supports this term and
8 condition also.

9 Again under Monitoring, MNR term and
10 condition No. 53, which states that:

11 "An annual report is to be prepared with
12 accordance with the requirements of
13 the timber management planning process
14 and shall include a summary of the
15 following timber management activities
16 including renewal and maintenance",

17 industry supports this term and condition and the other
18 ones I have just mentioned in that we believe that
19 those terms and conditions are in the public interest
20 and adequately serve timber managers and, therefore,
21 are in the interest of the Industry as well.

22 There are, in addition to these terms and
23 conditions proposed by the MNR, some others that are
24 relevant to tending and which the Industry has some
25 concern.

1 MNr term and condition No. 12 under
2 Planning of Access, Harvest, Renewal and Tending
3 Operations, term and condition No. 13 states that:

4 "The approach and planning requirements
5 for the development of specific
6 operational prescriptions for harvest,
7 renewal and tending operations in areas
8 of concern are accepted and particulars
9 of this condition are as follows:

10 (a) There shall be initial determination
11 as to whether or not timber management
12 operations can be carried out while
13 protecting the identified value..."

14 The meaning of this term and condition is
15 not entirely clear to the Industry. We have
16 interpreted this term and condition to mean that in
17 relation to tending operations, operational planning
18 for application of herbicides will include the
19 considerations of and utilization of mitigating
20 measures, for example, effective use of buffer zones
21 and effective selection of block boundaries in order to
22 minimize chances of off target application of herbicide
23 or effects of spray drift.

24 If this interpretation that the Industry
25 has made is correct, then the Industry supports this

1 part of the planning process and, hence, this part of
2 this term and condition.

3 Under Prescribed Burns and Pesticide
4 Projects, MNR condition No. 36 states that:

5 "Projects in an annual work schedule
6 which involve aerial application of
7 herbicides shall be planned, reviewed and
8 approved in accordance with the
9 respective procedures set out in the
10 documented aerial application of
11 herbicides for forest management in
12 Ontario."

13 It is the Industry's position that in
14 respect of tending operations this condition provides
15 that aerial herbicide projects will be planned,
16 reviewed and approved in accordance with MNR procedures
17 for the aerial application of herbicides for forest
18 management in Ontario which is MNR procedure No. FR 04
19 20 10.

20 The Industry carries out aerial
21 application of herbicides according the procedure set
22 out in the Guide for the Preparation of Implementation
23 Manuals for the Aerial Application of Herbicides in
24 Ontario, which is Exhibit 641, and also in the
25 guidelines for aerial application of herbicides which

1 is Exhibit 662.

2 The Industry understands that this is
3 what is meant in this MNR term and condition and,
4 therefore, the Industry supports this condition.

5 Also under Prescribe Burns and Pesticide
6 Projects, MNR term and condition No. 39 states that:

7 "Each aerial application of a herbicide
8 or an insecticide which is undertaken for
9 timber management purposes shall be the
10 subject of a project description and
11 operational plan. Particulars of this
12 condition are:

13 (a) project description; and.

14 (b) operational plans."

15 Again, as with condition No. 36, the
16 Industry understands that project descriptions and
17 operational plans for Industry administered aerial
18 application projects will be prepared by the Industry
19 as per the guide for the preparation of implementation
20 manuals for the aerial application of herbicides in
21 Ontario. The Industry, therefore, supports this
22 condition.

23 Q. Can I stop you there, Mr. Tomchick.
24 When you referred to the guide, Exhibit 641 before the
25 Board is is entitled Guide for the Preparation of

1 Implementation Manuals for the Aerial Application of
2 Herbicides in Ontario. Is it to that guide that you
3 were referring?

4 A. That's correct.

5 Q. Thank you.

6 A. As well, under Guidelines and Manuals
7 for Timber Management, MNR's term and condition No. 40,
8 which states that:

9 "MNR's approved implementation manuals as
10 amended from time to time shall be used
11 in the planning and carrying out of
12 timber management activities. These
13 implementation manuals include provincial
14 guidelines and construction operational
15 manuals, the use of which is mandatory in
16 timber management and resource
17 environmental manuals which are used as
18 required, including under Construction
19 Operational Manuals, the aerial spraying
20 for forest management and operational
21 manual 1981."

22 Again, the Industry has no objection to
23 this condition, but would like to emphasize that this
24 condition applies to MNR operations only as outlined in
25 my discussion of MNR term and condition No. 36 and 39.

1 The Industry carries out its aerial herbicide projects
2 according to the procedures set out in Exhibit 641.

3 Under monitoring, MNR condition number --
4 term and condition No. 51, which states that:

5 "MNR shall undertake a provincially
6 coordinated program to develop further
7 information on forest growth and yield as
8 influenced by site, forest structure,
9 silvicultural treatments and natural
10 events."

11 The Industry -- the OFIA/OLMA strongly
12 supports this condition in that the Industry is
13 concerned with the general lack of long-term growth and
14 yield data.

15 In respect of tending operations, such
16 growth and yield data should be collected on a regular
17 basis by MNR to assess growth response on lands treated
18 with herbicides and to provide a strong database of
19 response and effectiveness data to timber managers.

20 The Industry has given evidence on this
21 data -- on this particularly by Dr. McCormack. It is
22 critical that the need for such a data collection and
23 analysis program be recognized both by the provincial
24 government and that it receive an adequate funding
25 commitment from the MNR.

1 MNR has indicated in their evidence,
2 specifically in Exhibit 936, that a growth and yield
3 data collection analysis program would cost \$300,000
4 over and above current growth and yield data collection
5 costs.

6 The Industry is concerned that a proper
7 growth and yield data collection and analysis program
8 would cost significantly more than this \$300,000
9 incremental amount. Adequate priority should be
10 attached to the need for that research by the
11 government.

12 That's all I have with respect to MNR
13 terms and conditions.

14 Q. Has the OFIA/OLMA proposed, in light
15 of the position you have just described, any particular
16 terms and conditions with respect to tending?

17 A. Yes, for reasons outlined in the
18 evidence of the panel, including in particular that the
19 Industry is convinced that the continued availability
20 and use of herbicides for timber management is
21 essential, that the aerial application of herbicides in
22 many instances is the only practical and effective
23 tending tool available today and that there is a need
24 for continued research into development of new
25 herbicides into -- sorry, that there is a need for

1 continued research into and development of new
2 herbicides and related technology for timber managers.

3 The OFIA/OLMA is proposing to the Board
4 for their consideration three additional terms and
5 conditions relating to tending.

6 Q. What are they, Mr. Tomchick?

7 A. If I can get the overhead set up
8 again.

9 Q. I think you are going to have to move
10 that over, Mr. Tomchick. Thank you.

11 A. The OFIA/OLMA is proposing three
12 terms and conditions with respect to tending. They are
13 term and condition No. -- OFIA/OLMA term and condition
14 No. 80 which states that:

15 "The use of authorized herbicides in
16 tending is an essential and effective
17 part of a sound timber management
18 program. The OMNR and other timber
19 managers in the area of the undertaking
20 may continue to use herbicides for
21 tending and for site preparation purposes
22 in appropriate circumstances and subject
23 to compliance with all applicable federal
24 and provincial regulatory controls."

25 And, Madam Chair, Mr. March, I would like

1 you to note there is an error in this slide. It should
2 state in the fifth line:

3 "Herbicides for tending and/or site
4 preparation purposes."

5 Insert and/or.

6 OFIA/OLMA term and condition No. 81

7 states that:

8 "The OMNR in conducting its timber
9 management program in the area of the
10 undertaking shall encourage and
11 financially support research and
12 development for the registration of
13 additional herbicides for use in tending
14 and site preparation activities in
15 appropriate circumstances and subject to
16 compliance with all applicable federal
17 and provincial regulatory controls."
18 Finally, OFIA/OLMA term and condition No.

19 82:

20 "In the analysis and consideration of
21 management options and alternative
22 tending options, where there is a debate
23 over the use of herbicides, the OMNR
24 shall ensure that analysis and
25 consideration of the potential effects of

1 not utilizing herbicides in a proposed
2 tending operation are carried out."

3 MS. CRONK: Madam Chair, Mr. Martel, a
4 copy of those terms and conditions forms part of
5 Exhibit 1133 that has been previously provided to the
6 Board.

7 Thank you, Mr. Tomchick.

8 Q. Dean Carrow, could I ask you to do
9 the same thing, if you would, please, with respect to
10 the MNR's terms and conditions relating to protection.
11 First, are you familiar with them?

12 DEAN CARROW: A. Yes, I am.

13 Q. Could you outline for the Board,
14 please, what position the Industry takes with respect
15 to those terms and conditions, and overall what the
16 Industry is proposing by way of terms and conditions
17 with respect to protection issues?

18 A. There are five terms and conditions
19 proposed by the Ministry of Natural Resources which
20 relate specifically to activities relating to
21 protection which the Industry would like to comment on.

22 There are a number which the OFIA/OLMA
23 agree with and support strongly. One of them, No. 8,
24 the Report of Past Forest Operations has already been
25 mentioned by Mr. Tomchick, that is the one that

1 requires that the timber management plan include a
2 report of the area treated for the past five years with
3 respect to insect control operations, and the Industry
4 supports this proposal.

5 Term and condition No. 34 of the Ministry
6 of Natural Resources is a proposal that public
7 notification be used relative to proposed insect
8 control projects, and Industry supports that term and
9 condition for public notification.

10 No. 39 is the term and condition that
11 requires a project description for each aerial
12 application program, in this case, aerial application
13 of insecticides, and that project description is
14 described in detail within the Ministry term and
15 condition No. 39. Industry supports the concept of
16 project description.

17 Term and condition No. 40 is the
18 proposition that a requirement that the operational
19 spraying manual be used for the the aerial application
20 of insecticides and Industry supports that term and
21 condition.

22 We do, however, have some reservations
23 regarding term and condition No. 38 proposed by the
24 Ministry of Natural Resources. At the outset, I would
25 say that Industry supports the general concept of that

1 term and condition, but we have particular reservations
2 about the provision for a bump-up which is suggested in
3 clause -- or term and condition No. 38(b).

4 The reasons for that reservation are
5 several, the primary one being that with respect to
6 insect control, the opportunity for control, the
7 opportunity for protection spraying programs, if you
8 want, comes along only once a year. If we look at any
9 of the major forest pests, jack pine budworm, spruce
10 budworm, forest tent caterpillar, gypsy moth, the
11 opportunity for control of those pests or protection of
12 the forest in fact comes along just about this time of
13 the year, but it only happens once in the year.

14 The suggestion under the bump-up clause
15 is of course that the bump-up can be requested any time
16 during the 30-day public review period immediately
17 prior to the operation taking place, and with the
18 suggestion -- or also with the condition that the
19 decision shall be made by the Minister within 45 days.

20 With this particular situation, I'm sure
21 you can appreciate that given the opportunity for
22 control action to be taken once a year and that there
23 is an opportunity for bump-up to be requested shortly
24 before the operation is to be undertaken with a
25 decision that could well take as long as 45 days, it is

1 quite conceivable that the opportunity for protection
2 spraying programs or control programs could be lost for
3 the year, simply because the decision will delay the
4 onset of that particular operation until it is too late
5 biologically.

6 I think the consequence of that
7 particular delay can have some very serious impacts,
8 and I would just remind you of the table that I
9 presented a couple of weeks ago in my evidence which
10 related to the history of the gypsy moth. And if we
11 looked at -- and I can just refresh your memory on
12 that.

13 In 1982, the size of that problem was
14 around 4,800 hectares. There was essentially no
15 control action of any particular magnitude taken on in
16 that year and in the space of one year that problem
17 expanded approximately eightfold. So the consequences
18 of not taking timely action in these situations can be
19 quite severe.

20 The other major reason for having
21 reservations about the inclusion of a bump-up clause,
22 particularly with respect to aerial application of
23 insecticides, is that it's our position that there are
24 already adequate regulatory controls in place in Canada
25 and in Ontario to preclude the need for an individual

1 assessment of an aerial spraying project involving
2 insecticides.

3 First of all, we have in place a
4 comprehensive federal registration system for all
5 pesticides, including those used in forestry. That
6 system includes an evaluation of environmental and
7 health impact data by five federal departments involved
8 in the registration process, and the fact that that
9 product has been registered for forestry use
10 constitutes an assurance that the use of that material,
11 according to label instructions, will not result in an
12 unacceptable hazard in the forest environment. That
13 federal regulatory system is generally regarded as one
14 of the most rigorous and demanding in the world.

15 And it's my view that there is no
16 evidence at the present time that that particular
17 particular system has failed us. There have been --
18 there is no recent evidence that in fact this system is
19 not providing adequate protection of health and the
20 environment.

21 Subsequent to federal registration, of
22 course, every pesticide in the Province of Ontario is
23 scheduled for use by the Ministry of the Environment
24 and under that scheduling procedure, the conditions
25 under which that particular pesticide can be used in

1 Ontario are defined fairly precisely. And, in fact,
2 the Ministry of the Environment, under its legislation
3 has the option of imposing more restrictions on the use
4 of that material than were imposed under the federal
5 registration process. The Ministry of the Environment
6 cannot be less restrictive, but it has the option to be
7 more retractive.

8 Again, using that provincial pesticide
9 scheduling process which has been in place for many
10 years in Ontario, there is no evidence in my view that
11 that system has failed with respect to forestry
12 insecticides.

13 A further requirement with respect to
14 aerial application of insecticides in forestry is that
15 an individual site specific permit be issued for every
16 single project by Ministry of the Environment. Quite
17 often in my experience those permits have with them a
18 set of conditions or a set of restrictions attached to
19 that permit; in other words, it provides authorization
20 for the application of that material and that
21 particular site subject to a number of conditions which
22 are tailored to meet the particular needs of that site.
23 If you want, it amounts to an individual site specific
24 assessment of that material on that particular site and
25 how it's going to be used.

1 I guess our fourth concern, Madam Chair
2 and Mr. Martel, is that our understanding is that the
3 purpose of the class environmental assessment hearings
4 in fact is to avoid the necessity of the assessment of
5 a large number of individual projects and certainly the
6 provision for bump-up would raise that possibility.

7 In summary, then, the view of the
8 Industry is that the bump-up has the potential to
9 seriously disrupt operational planning and insect
10 control operations from year to year with the result
11 that opportunities for essential foliage protection or
12 essential insect control could very well be lost for a
13 one-year period.

14 It's also our position that the existing
15 regulatory controls at the federal and provincial level
16 are certainly adequate to ensure that those materials
17 are used in accordance with all of the federal and
18 provincial regulations and in a way that is compatible
19 with the concept of protection of health and the
20 environment.

21 There is one other subsection of term and
22 condition No. 38, which is 38(e), and that makes
23 specific reference to the consideration and analysis of
24 management options which the Ministry has suggested.
25 It is the view of Industry that this particular

1 consideration and analysis of the options should
2 specifically include analysis of the consequences of
3 not protecting an area that requires protection; in
4 other words, the consequences of not undertaking
5 control action when the necessity of that control
6 action has been demonstrated and that would include the
7 consequences of not using an approved chemical
8 insecticide, as well as the consequences of not using
9 an approved biological insecticide.

10 And I believe that summarizes our
11 concerns with respect to your companies with respect to
12 terms and conditions relating to the application of
13 insecticides for insect control.

14 Q. And in light of the evidence that you
15 have presented to the Board and the position of the
16 Industry that you have outlined, are there specific
17 terms and conditions relating to protection per se that
18 are being proposed by the OFIA/OLMA for consideration
19 by the Board?

20 A. Yes, there are, and I would like to
21 just use the overhead for a moment to display those.

22 MS. CRONK: Mr. Shibatani informs me,
23 Madam Chair, that they are part of the same Exhibit
24 133, there is a copy before you.

25 DEAN CARROW: The terms and conditions

1 that relate specifically to protection activities are
2 found in the OFIA/OLMA terms and conditions. No. 83 is
3 the first one, Madam Chair and Mr. Martel.

4 I won't read these verbatim, it's a
5 little tedious, but I think I would just try to
6 paraphrase them quickly.

7 The Industry supports the OMNR policy FRO
8 4 10 01 which specifically states that aerial spraying
9 of insecticides can be undertaken in the Province of
10 Ontario for three purposes: (1) being outbreak
11 control, that is to suppress an insect infestation which
12 is at the point where it is developing to epidemic
13 levels; secondly, to contain an existing outbreak so
14 that it does not expand beyond the area it's currently
15 infesting into areas that are generally free of the
16 insect; and, thirdly, to protect foliage, that is, to
17 protect trees and foliage in areas that are heavily
18 infested by the insect but with those spraying
19 activities or protection activities targeted to defined
20 forest areas.

21 Further to that, term and condition No.
22 84:

23 "The Industry believes that priority
24 should be given to the strategy of early
25 intervention as its preferred protection

1 strategy; and, that is, that protection
2 programs should focus in order of
3 priority on outbreak control first,
4 failing that, to undertake outbreak
5 containment programs, and failing the
6 availability of that option, to then rely
7 on foliage protection programs."

8 No. 85:

9 "The Industry believes that the use of
10 authorized insecticides including the use
11 of chemical insecticides is an essential
12 and effective part of a sound protection
13 program. We believe the Ministry of
14 Natural Resources should consider the use
15 of chemical insecticides and may use them
16 for protection of the timber resource in
17 those circumstances where no other
18 effective insecticide is available or
19 practical and subject to compliance with
20 all federal and provincial regulatory
21 controls."

22 Just to build on that further, term and
23 condition 86 states that:

24 "The Ministry of Natural Resources shall
25 not pursue general policy or practice of

1 prohibiting the use of chemical
2 insecticides for protection purposes
3 unless (a) another effective insecticide
4 is available and practical to respond to
5 the relevant insect pest; and, (b) the
6 policy or practice is warranted in light
7 of scientific evidence establishing the
8 likelihood of unacceptable environmental
9 or health impacts."

10 No. 87 refers to the encouragement and
11 support of research and it is the Industry's view that
12 the Ministry should encourage and financially support
13 research and development directed towards the
14 registration of additional insect control agents
15 including chemical insecticides for use in appropriate
16 circumstances and subject to the appropriate regulatory
17 controls.

18 Term and condition 88 relates to the need
19 for the development of appropriate standards for the
20 assessment of the effectiveness of foliage protection
21 programs and it's the Industry's view that the Ministry
22 should conduct the necessary research to determine an
23 appropriate quantitative standard or standards against
24 which foliage protection programs can be measured
25 annually and that those standards should be used to

1 assess the effectiveness of the foliage protection
2 spray programs on an annual basis.

3 89 follows that with the statement that:

4 "The Ministry should assess annually the
5 effectiveness of its foliage protection
6 programs as measured against the
7 standards mentioned in Condition 88."

8 Further to this, the Industry believes
9 that the Ministry should conduct the necessary research
10 to establish appropriate standards whereby the
11 effectiveness of its programs for outbreak control and
12 for outbreak containment could be measured in the
13 future.

14 And the last one, Madam Chair, is 91
15 which proposes that:

16 "In analysing and considering the
17 management options and alternative
18 protection options, that the Ministry
19 shall ensure that an analysis of
20 consideration of the potential effects
21 of not utilizing chemical insecticides in
22 a proposed operation are carried out."

23 MS. CRONK: Q. Thank you, Dean Carrow.

24 Are those then all of the terms and conditions proposed
25 by Industry particular to the protection and the use of

1 insecticides?

2 DEAN CARROW: A. Yes, they are.

3 MS. CRONK: Thank you, panel. Those are
4 all my questions in-chief of this panel, Madam Chair,
5 Mr. Martel.

6 MR. MARTEL: Can I just ask a question?

7 MS. CRONK: Yes.

8 MR. MARTEL: Last week we heard that both
9 in Sweden and in I think, it's Finland - just let me go
10 back for a moment. I just want to - unless I
11 misunderstood - you said neither Sweden or Finland use
12 herbicides or pesticides now and that in the State of
13 Minnesota in fact there was a movement away from the
14 use of herbicides in Minnesota, and I am just wondering
15 if that is factual or not now, if anybody on the panel
16 can help me?

17 MS. CRONK: Dr. McCormack?

18 DR. McCormack: Mr. Martel, I can address
19 at least parts to both those points. The Minnesota one
20 is the most difficult because what you are stating is,
21 with the exception of the land, the federal land that
22 is managed by the USDA Forest Service, I am not aware
23 of a policy development relative to the use of
24 herbicides.

25 I do know that they have a very active

1 research and development program, actually Minnesota is
2 one of the leading states in having such a program. I
3 know that program is still active because I have been
4 in communication with them within the last weeks about
5 that, so this is a surprise to me.

6 MR. MARTEL: No, maybe I was wrong. I
7 think it was federally owned land that they were
8 talking about.

9 DR. McCORMACK: There used to be, as
10 there is now, in other states a federal policy that has
11 suspended the use, but they have not totally cancelled
12 use. They're in the process of a fairly thorough
13 review of practices on the federal lands and it may
14 relate to that. But, as I say, I'm not aware of
15 anything at the state level.

16 As far as the question of Sweden and
17 Finland, I am familiar with the situation there,
18 especially in Sweden, and it is ecologically,
19 biologically impossible to make a direct comparison
20 with the forests and the forest management in those two
21 nations. They are considerably further north than we
22 are, the energy budget which exists on the forest floor
23 is distinctly different, the species present are
24 different, in fact they only have three or four
25 commercial species depending on how one looks at it, so

1 that the natural situation relative to competing
2 vegetation and the ability of that competing vegetation
3 to develop on the forest floor are significantly
4 different, and though they do have some competing
5 vegetation problems, they are not in any way at the
6 level that we experience in our part of the world,
7 which is typical in the area of the undertaking.

8 One example that comes to mind that
9 relates to this, as far as forestry practices in Sweden
10 go, is the company we know now as Stora Forest Products
11 that operates in Cape Breton in the Nova Scotia area
12 which is Swedish owned and also practices forestry in
13 Sweden, find it not necessary to use herbicides in
14 Sweden but do have an active herbicide program in the
15 Province of Nova Scotia.

16 That is a direct reflection of these
17 ecological differences that I described earlier.

18 MS. CRONK: That concludes the direct
19 examination, Madam Chair.

20 MADAM CHAIR: Thank you, Ms. Cronk.

21 Hello, Mr. Castrilli.

22 MR. CASTRILLI: Madam Chair, I would like
23 to move all my documentats and my associates to the
24 area where Ms. Cronk is. I am wondering if it would be
25 appropriate in the circumstances to take a five to

1 10-minute break to do so?

2 MS. CRONK: I said I would surrender the
3 floor, madam Chair, I said nothing about the chair or
4 the table, but I am sure we can work that out at the
5 break.

6 MADAM CHAIR: All right. Why don't we
7 take 10 minutes then.

8 ---Recess taken at 4:10 p.m.

9 ---On resuming at 4:25 p.m.

10 MADAM CHAIR: Please be seated.

11 MR. CASTRILLI: Thank you, Madam Chair.

12 MADAM CHAIR: Hello, Mr. Castrilli. You
13 are just going to get warmed up today. I think we will
14 sit until 5:00.

15 MR. CASTRILLI: Very well, thank you.

16 MADAM CHAIR: And have your time
17 estimates remained the same for cross-examination?

18 MR. CASTRILLI: Roughly a day and a half
19 to two days. I am tend to think I might be finished by
20 Wednesday morning, if that will be of any assistance to
21 you.

22 Madam Chair, before I begin I think it
23 would probably be appropriate for me to file the
24 interrogatories that were produced in response to our
25 questions on Panel 7 and I would ask that these be made

1 the next exhibit.

2 I have numbered each of the pages and
3 everyone should have a 35-page document.

4 MADAM CHAIR: That will be Exhibit 1192.

5 MR. CASTRILLI: (Handed)

6 ---EXHIBIT NO. 1192: Package of interrogatories filed
7 by Forests for Tomorrow re
OFIA/OLMA Panel 7.

8 MADAM CHAIR: Mr. Castrilli, would you
9 like to read out the question numbers?

10 MR. CASTRILLI: The question numbers are
11 Questions 1 through 20 inclusive.

12 MADAM CHAIR: All right.

13 MR. CASTRILLI: Madam Chair, that was
14 exhibit...?

15 MADAM CHAIR: 1192.

16 CROSS-EXAMINATION BY MR. CASTRILLI:

17 Q. Now, I am wondering if I can begin
18 by referring you to page 59 of what would be Exhibit
19 1131, that's your Panel 7 evidence.

20 Panel members, I am referring you there
21 to the first full paragraph on the page and --

22 MR. FREIDIN: What page?

23 MR. CASTRILLI: Page 59.

24 Q. Sorry, the last full paragraph on the
25 page, the paragraph that begins:

1 "The Industry supports the view that
2 predictable and continuous wood supply
3 can be achieved through the planning
4 requirements of timber management plans."

5 Can I take it, and I think probably for
6 the purposes of this question and the first couple of
7 questions you can take it that I am referring my
8 questions primarily to the OFIA members of the panel,
9 if any of the other members of the panel wish to
10 contribute with respect to this matter, I am content to
11 have their answers as well.

12 Do I understand your testimony,
13 gentlemen, with respect to this paragraph at the bottom
14 of the page that it's the OFIA's position that it
15 endorses the position of MNR that a predictable and
16 continuous wood supply is necessary?

17 MR. STANCLIK: A. Yes, I think that's
18 fair to say.

19 Q. And does the MNR position define the
20 species -- let's begin again. Does the MNR position
21 define the species that it is necessary to have a
22 predictable and continuous supply of?

23 MR. TOMCHICK: A. I don't think it
24 defines the species, it defines the species that are
25 appropriate to the needs of the mill.

1 Q. Does the MNR definition, as you
2 understand it, gentlemen, indicate the supply -- or
3 that the supply must be of any particular species?

4 MR. STANCLIK: A. Not of any particular
5 species. As Mr. Tomchick said, the species that the
6 particular mill requires.

7 Q. So I could refer you gentlemen to the
8 first interrogatory question that appears on page 1 of
9 what is now Exhibit 1192.

10 The question we asked you is:

11 "What is the predictable supply of timber
12 that the Industry/OMNR expects to
13 achieve? "

14 And your answer was:

15 "The OFIA/OLMA expects to obtain an
16 adequate supply to meet prevailing
17 consumption requirements (subject to
18 change from market forces) of OFIA/OLMA
19 mills."

20 Now, I want to explore that answer with
21 you. I would like to return you to the question for a
22 moment. Is it your understanding that the
23 predictable -- what is your understanding of the
24 predictable supply of timber that the OMNR expects to
25 achieve?

1 MR.. TOMCHICK: A. Is this in reference
2 to an existing or a proposed timber management -- or
3 timber production policy?

4 Q. Whatever is in the body of evidence
5 on the record, Mr. Tomchick.

6 A. The evidence does not refer to any --
7 the way I read it, does not refer to any current or
8 proposed timber production policy, if that is what you
9 are referring to. It just refers to a predictable and
10 continuous wood supply, and no capitals on any of those
11 letters.

12 Q. Well, gentlemen, just speaking -- or
13 just speaking to you in your roles as members of
14 various companies in this province, do you agree that a
15 first step in understanding this issue would be to
16 determine what a predictable supply of wood is?

17 MS. CRONK: Madam Chair, I am going to
18 have to rise. I didn't want to do it as early in the
19 cross-examination so I sat through the first two or
20 three questions.

21 I had exactly this exchange with Ms.
22 Swenarchuk with the renewal panel. I have no
23 objections to questions based on what is in this
24 statement of evidence, obviously as it relates to the
25 expertise in tending of these witnesses, but Forests

1 for Tomorrow has cross-examined the Industry wood
2 supply panel, they've cross-examined the Industry
3 renewal panel.

4 Are we now to have the same questions
5 about supply calculations, quantification of
6 projections of future supply that we had to those
7 panels. I'm sorry, I don't think that's appropriate
8 for these gentlemen.

9 The comment is made in this report
10 apropos of a comment that protection and tending is
11 needed, not in terms of how one goes about doing supply
12 or demand calculations for wood supply projections.

13 MR. CASTRILLI: Madam Chair --

14 MS. CRONK: I would like to get that
15 groundrule established upfront.

16 MR. CASTRILLI: Madam Chair, I'd like to
17 deal with that objection because I don't think it's an
18 appropriate one in the circumstances.

19 We are dealing here on this panel with
20 the issue of tending and protection in relation to the
21 forest timber supply and the issue of what herbicides
22 and insecticides will focus on and the effect they may
23 have on the issue of supply is relevant.

24 In fact, it's been raised by evidence of
25 this panel and it's in fact raised in the first page of

1 this evidence, and I would like some latitude in
2 establishing the linkage between what I am dealing with
3 now and the substantive subject matter of this panel.

4 I don't intend, frankly, to be very much
5 longer on this particular issue, but I think the
6 connection will become apparent very shortly.

7 MADAM CHAIR: Well, what are your
8 questions relating it to tending and protection, Mr..
9 Castrilli?

10 MR. CASTRILLI: Well, I've got a few. Do
11 you want me to list them all and then decide whether
12 they are all each appropriate?

13 MADAM CHAIR: Well, I think the problem
14 we are having here is we have had heard Ms. Swenarchuk
15 try to get something more about what predictable supply
16 means in other panels, and before we will allow that
17 kind of question to proceed here we want to know how
18 it's tying in with tending and protection.

19 MR. CASTRILLI: I would be pleased to
20 just give you a preview you then.

21 Madam Chairman, this panel, as indicated
22 to you, that it has -- there is a crop species that it
23 wishes to engage in tending and protection activities
24 to enhance the growth and development of and it seems
25 to me it's appropriate for this panel to explore the

1 issue of crop species versus weed species because it is
2 at the heart, in my submission, of the entire program
3 with respect to herbicides and also with respect to
4 insecticides.

5 Before you know what you should be
6 spraying to get rid of, you ought to know what your
7 supply of wood is going to be in future and the two are
8 in my view, in my respectful opinion, completely
9 interconnected and cannot be, as Ms. Cronk suggests,
10 completely separated out into other panels.

11 This issue does come up repeatedly, but
12 in this particular case this issue relates directly to
13 the issue of what in fact will be the future crop
14 species that we either spray for or spray to get rid
15 of.

16 MADAM CHAIR: So you want to know
17 something about the volume of crop species?

18 MR. CASTRILLI: I want to know what this
19 panel knows about what they believe the future crop
20 species is that requires that we spray to eliminate one
21 particular or several particular species to enhance a
22 preferred crop species.

23 MADAM CHAIR: Then you want them to tell
24 you in terms of predictable supply what they feel the
25 crop species are that comprise that predictable supply?

1 MR. CASTRILLI: That's part of it.

2 That's part of the direction, yes, Madam Chair.

3 MADAM CHAIR: Well, put a question like
4 that to the witnesses and let's see what we get.

5 MR. CASTRILLI: If I could, I would like
6 to develop it a little bit so they have a clear
7 understanding of where we're going.

8 Q. Now, at the bottom of page 1,
9 gentlemen, you refer to the fact that the Industry is
10 of the view that a predictable and continuous wood
11 supply can be achieved through the planning
12 requirements of timber management plans.

13 And in your answer to our interrogatory
14 you indicate that the OFIA expect to obtain an adequate
15 supply to meet prevailing consumption requirements
16 subject to change from market forces.

17 If an adequate supply of timber is going
18 to be subject to change from market forces in order to
19 meet prevailing consumptive requirements, isn't that
20 going to affect management planning vis-a-vis the
21 timber management plans?

22 MR. STANCLIK: A. Market forces will
23 dictate to some extent what our future planning will
24 be. Is that what you mean?

25 Q. Well, let me put the question to you

1 this way, Mr. Stanclik: If market forces change and
2 the adequate supply changes, can you still have a
3 predictable supply of timber?

4 A. Yes, the Industry will be adjusting
5 as it guess along to account for any market changes
6 and, therefore, allowance will be made and the adequate
7 supply will remain.

8 Q. Can you advise the Board whether the
9 changes expected in consumptive requirements will be in
10 volume?

11 MS. CRONK: I'm sorry, Madam Chair. How
12 does that have anything to do with the expertise of
13 this panel?

14 MR. CASTRILLI: Madam Chair, once again,
15 I am going to ask for latitude in dealing with this
16 issue and I will be -- as I indicated earlier, it will
17 be relevant to the issue of this panel and the issue of
18 what we spray to get rid of and what we spray to keep.
19 I would like some latitude on that issue you.

20 MS. CRONK: That may be, but that
21 particular question I take objection to.

22 MADAM CHAIR: Let's get to that point
23 quickly, Mr. Castrilli, because the Board has heard
24 lots of evidence over two years about what is
25 predictable and not predictable in the timber

1 management planning process and we recognize that
2 markets change and forecasts change.

3 Let's get into tending and protection as
4 quickly as we can.

5 MR. CASTRILLI: Q. Let me just ask you,
6 Mr. Stanclik, can you advise the Board whether the
7 changes expected in consumptive requirements will be in
8 species?

9 MR. STANCLIK: A. The changes may be in
10 species, but at the moment we don't forecast that. If
11 you will refer to your interrogatory No. 3, you will
12 see we are anticipating the desirable species to be the
13 same in the future.

14 MR. TOMCHICK: A. If I might add to Mr.
15 Stanclik's comment. The company -- on behalf of the
16 company that I work for, Quebec and Ontario Paper
17 Company, we are in the business of producing the
18 highest possible quality newsprint that we can and
19 under current technology you do that with black spruce
20 fiber.

21 So you can make inference there that
22 black spruce, in terms of our company's requirements,
23 would be a crop tree, a desirable crop tree in the
24 future.

25 Q. Well, let me just ask you this

1 question, Mr. Tomchick. Suppose the market was going
2 to or wanted to double spruce production, is it your
3 testimony that the timber management units, the FMAs
4 could in fact do that?

5 MR. TOMCHICK: A. I don't know:

6 Q. Turning to page 60, gentlemen, of
7 your evidence. Looking at the bottom of page 60 where
8 you indicate that:

9 "Losses of desirable species due to
10 competing vegetation are significant
11 factors affecting the security of future
12 wood supplies."

13 Do you still agree with that assessment.

14 A. Yes.

15 Q. Would it be fair to say that this
16 statement that I just read into the record; that is,
17 losses of desirable species will affect future wood
18 supplies, is based upon the assumption that future
19 demand will require the same species?

20 A. Based on current technology, current
21 market forecasts that I'm aware of, yes.

22 Q. Can I refer you to page 62.

23 MS. CRONK: I'm sorry, what page?

24 MR. CASTRILLI: 62.

25 Q. Looking at the first two points on

1 the page, would it be fair to say that what your
2 evidence is getting at is that, firstly, the purpose of
3 vegetation control is to increase desirable tree
4 species; and, secondly, that spraying can increase the
5 growth and survival of the desired species at the
6 expense and the growth of the "weed species"?

7 Mr. McCormack, I think perhaps this
8 probably is best directed to you.

9 DR. McCORMACK: A. You are looking at
10 the first two numbered paragraphs?

11 Q. Yes, the first two numbered paragraphs
12 on page 62.

13 A. I think probably the first objective
14 as one looks at vegetation management is that which is
15 stated in the very first sentence of No. 1: Relative
16 to availability of site resources, and if it follows
17 from that that then there is the benefit from the
18 desirable tree species, that those are the major
19 objectives.

20 A consequence in carrying that out is a
21 suppression, in most cases quite temporary, of the
22 competing vegetation whatever those species might be
23 which, of course, as you pointed out, is determined by
24 the crop tree species.

25 MR. STANCLIK: A. Mr. Castrilli, our

1 main goal then in tending is to make sure that those
2 crop trees survive and make it to free to grow. The
3 benefits of growth and yield are in addition to that
4 primary goal of survival.

5 Q. I believe, Mr. Stanclik, you referred
6 to Interrogatory Question 3. I would like to refer to
7 it now, it's on page 4 of what is Exhibit 1192.

8 MR. STANCLIK: A. Yes.

9 Q. Referring to the two bulleted items
10 that are on that page, we asked you what the species
11 was that Industry expected to be desirable in 60 to a
12 hundred years -- or, sorry, 60 and 100 years from now.

13 Your answer indicated that the OFIA
14 expected that the desirable species 60 and 100 years
15 hence will be the same species which are desirable
16 today. It is not possible to proceed on any other
17 assumption given that market forces and demands 60 and
18 100 years hence cannot reliably be predicted today.

19 And I believe you earlier today indicated
20 your continued agreement with that position; is that
21 correct?

22 MR. STANCLIK: A. That's correct.

23 Q. Do desirable species change over
24 time?

25 A. They may under certain circumstances.

1 If new markets develop for a product, a species that
2 previously -- pardon me, a new market develops for a
3 product and a different species is used for that
4 product than previously, then you may end up with
5 having a species that was undesirable, but it's
6 difficult to predict that into the future.

7 If I can give you an example --

8 Q. Please do.

9 A. In northeastern Ontario, many areas
10 there are large concentrations of poplar that were not
11 being used and there were considered undesirable. A
12 new waferboard mill was built to make oriented strand
13 board and, in certain areas of northeastern Ontario now
14 the poplar is a desirable species and we are managing
15 for it.

16 So as the market demands change, the
17 objectives and strategies in timber management planning
18 will change to account for it.

19 Q. Mr. Stanclik, from your experience
20 would you agree that jack pine was considered a weed
21 species for pulpwood in Ontario prior to the 1960s?

22 A. I do not deal that much in jack pine
23 so I am not familiar with the status of it, I'm
24 primarily black spruce.

25 Q. Are any of you gentlemen familiar

1 with jack pine.

2 MR. FERGUSON: A. Perhaps I could speak
3 to that. My company, Canadian Pacific, originally was
4 a newspaper print manufacturer dealing exclusively in
5 black spruce. Although jack pine was not considered a
6 weed species by the company in earlier years, there was
7 a very limited market for that.

8 Over the years our company has installed
9 first one kraft mill and then a second kraft mill, back
10 in 1975 I believe, which made use of the jack pine as
11 well a stud mill which makes use of the jack pine.

12 Q. I'm sorry, Mr. Ferguson, I missed the
13 last part of your answer.

14 A. We added a stud lumber production
15 line to our mill complex, so in fact a species which
16 was underutilized as recently as a little over 30 years
17 ago is now one of our major species.

18 We have -- a third species I guess which
19 is of considerable importance to us is aspen/poplar.
20 We have been endeavoring for many, many years to
21 develop markets for our poplar which occurs in the
22 vicinity of our Thunder Bay complex, to the extent at
23 one time we had a particle board plant which did not
24 prove to be economical and has since closed.

25 We now been, for a number of years, been

1 producing hardwood kraft mulch, making use of the aspen
2 in the area, however my understanding of that market -
3 and I must confess, I am not directly involved with the
4 sales of the products and I am certainly not an expert
5 in wood supply - but just dealing from my
6 responsibilities as to supplying the mill, the market
7 for hardwood kraft produced from poplar is extremely
8 unpredictable and has, during the 16 years that I've
9 been working for Canadian Pacific, such that you really
10 can't predict from one month to the next what the
11 demand for the hardwood are, and our projections into
12 the future don't seem to have much change in store for
13 that.

14 So in some respects although poplar is
15 encouraged on some sites where it is expected to grow
16 well, it is not considered to be a major species for us
17 at this particular time.

18 Q. Mr. Smith, do you know whether
19 Abitibi in Thunder Bay does not use jack pine in its
20 mill?

21 MR. SMITH: A. Abitibi in Thunder Bay
22 uses somewhere between two and five per cent jack pine.

23 Q. The remainder would be spruce, black
24 spruce?

25 A. The remainder would be a mixture of

1 spruce and balsam fir.

2 Q. Gentlemen, would it be fair to say
3 that the preferred species that you are saving with
4 your spray program will be predominantly your conifer
5 softwoods that may be used in the future, but it is
6 possible that other species will be used as well, such
7 as the hardwoods.

8 MR. STANCLIK: A. For what purpose?

9 Q. For pulpwood or lumber purposes?

10 A. All those species are used in various
11 mills at this time for pulpwood and lumber to varying
12 degrees.

13 MR. TOMCHICK: A. If I might add, we
14 don't have a problem with the establishment and
15 survival of hardwood plantations or hardwood
16 regeneration, but we certainly have a problem with the
17 establishment and survival and growth and performance
18 of conifer plantations.

19 Q. Can I refer you to page 63. Mr.
20 McCormack, you refer in the second paragraph to the
21 fact that hardwoods had an inherent advantage over
22 conifers. Do you still agree with that evidence?

23 DR. McCORMACK: A. Yes, I do.

24 If I could add to that. In my evidence
25 when I -- in the early stages of my presentation of

1 evidence I used an overhead to illustrate ecological
2 characteristics of vegetation - that was my third
3 overhead - which was used to emphasize that very point
4 for selected species.

5 Q. That was the...?

6 A. The fishing chart.

7 Q. With the circles?

8 A. What I referred to as the fishing
9 chart with all the circles. That was an illustration
10 in detail of six silvical characteristics for the list
11 of species to illustrate that very point.

12 Q. So if hardwoods have an inherent
13 advantage over conifers, is there a value in the
14 industry encouraging uses for hardwoods?

15 MR. FERGUSON: A. I think I alluded to
16 that a few moments ago, that at the present time,
17 although we would like to make use of the hardwoods
18 where possible, the markets just do not exist at the
19 present time and at the present time we can't foresee
20 them developing.

21 Q. As I understand your response to my
22 Interrogatory Question 3, you don't really have a good
23 idea what will be valuable and what the market-driven
24 demands will be for particular species in 60 to a
25 hundred years; do you?

1 MR. STANCLIK: A. I don't think it's
2 possible to forecast with any degree of accuracy. That
3 is why the assumption has been made that the species
4 that are desirable now will be the ones that are
5 desirable in the future.

6 It's hard to start managing for species
7 that may not be desirable now in the hope that the
8 market will develop in the future for those species or
9 that the technology will develop to use those species.
10 You have to stay with what has already been proven and
11 work from there.

12 MR. CASTRILLI: Madam Chair, I am at a
13 reasonably appropriate place to break for the day, if
14 that would be acceptable to the Board.

15 MADAM CHAIR: Any time Mr. Castrilli.

16 MR. CASTRILLI: Thank you.

17 MADAM CHAIR: Thank you for beginning
18 when you only had a little while to go on, but we will
19 start tomorrow morning at 8:30.

20 MR. CASTRILLI: All right. That is fine,
21 thank you.

22 MADAM CHAIR: I might just ask, how you
23 long are you going to be in cross-examination, Ms.
24 Seaborn?

25 MS. SEABORN: My original estimate was

1 two to three hours, Madam Chair. I will be happy to
2 re-evaluate that after I've heard the other parties.
3 It may be a little bit less, I don't expect it to be
4 more.

5 MADAM CHAIR: Mr. Freidin?

6 MR. FREIDIN: Four hours, half a day.

7 MR. CRONK: I have received no indication
8 from Ms. Kleer as to how long NAN would be, except that
9 they intend to cross-examine, and I can tell the Board
10 that in my last discussion with Mr. Hanna he indicated
11 approximately one day.

12 MS. SEABORN: Madam Chair, in that regard
13 Ms. Kleer had phoned me last week to obtain some
14 information with respect to scheduling and she told me
15 that she would be three quarters of a day at that time.
16 I believe she's out of town until tomorrow.

17 MADAM CHAIR: Okay.

18 MR. MARTEL: I think we will finish in
19 December with this hearing -- not this hearing, but
20 this panel.

21 MADAM CHAIR: Well, all I can say, we
22 have got until Friday and then we have got to be done,
23 so I suggest the parties who are cross-examining get in
24 touch with each other and see how we can finish at five
25 clock on Friday.

1 MR. CASTRILLI: Madam Chair, speaking for
2 myself, I am content to sit later tomorrow if that
3 would be of any help.

4 MADAM CHAIR: Yes. Apart from the Board,
5 we sit five days already and we are a bit shell shocked
6 by five o'clock.

7 MR. CASTRILLI: I am sure you must be.

8 MADAM CHAIR: But perhaps you can get
9 together and someone can call Mr. Hanna and Ms. Kleer
10 and explain to them that we rise at five o'clock on
11 Friday and that is the end of Panel 7.

12 MR. CASTRILLI: Madam Chair, I have a
13 teeny bit of housingkeeping. I have two documents that
14 are unrelated this panel that I was asked to file in
15 their entirety during my last visit before this Board
16 in August of 1988. It hasn't taken 10 months to get
17 the documentation, but there was some difficulty in
18 realizing that they had not in fact been filed until
19 recently.

20 I am in your hands whether I should file
21 them now or file them first thing tomorrow morning.

22 MADAM CHAIR: You can file them now. Do
23 they have an exhibit number, Mr. Castrilli?

24 MR. CASTRILLI: Yes, they do.

25 MADAM CHAIR: Oh good.

1 MS. CRONK: It took him a year to
2 properly match them to come before the Board to accept
3 them.

4 MADAM CHAIR: He has a good memory.

5 MR. CASTRILLI: The first one is Exhibit
6 729, It's the Registration Standard for Pesticide
7 Products Containing Glyphosate as the Active
8 Ingredient. As you may recall, Madam Chair, some time
9 last August I filed excerpts of that document and, as I
10 recall, one or more of the parties and the Board
11 Chairman wanted the entirety of the document.

12 MADAM CHAIR: Thank you.

13 MR. HUFF: (handed).

14 MR. CASTRILLI: Madam Chair, the
15 second -- and, Madam Chair, I would suggest that we
16 make the full document Exhibit 729 and the excerpts
17 should remain as 729 A.

18 MADAM CHAIR: And do you know if that is
19 what it read on the record?

20 MR. CASTRILLI: I believe actually that
21 was contemplated for some other documentation that was
22 filed as excerpts originally and it would be appropriate
23 to do the same thing in this case.

24 The second document is Exhibit 748, it's
25 entitled: Guidance for the Re-registration of

1. Pesticide Products Containing 2,4-D as the Active
2 Ingredient. And again I would propose that the full
3 document be made Exhibit 748 and the excerpt remain as
4 Exhibit 748A.

5 And, Madam Chair, I would advise that
6 there are two other documents coming that I would
7 propose to substitute in their entirety for the
8 excerpts that currently exist on the record and as soon
9 as I am - in fact I am awaiting them - I will be making
10 them available.

11 MADAM CHAIR: Were these two documents
12 made exhibits during MNR's Panels 12 and 13?

13 MR. CASTRILLI: It would have been during
14 my cross-examination of Panels 12 and 13, part II.

15 MADAM CHAIR: I remember, Dr. Ritter's
16 aborted flight to Winnipeg.

17 MR. CASTRILLI: Yes, that's right.

18 MADAM CHAIR: All right, thank you

19 Very well, we will adjourn until 8:30
20 tomorrow morning.

21 MR. CASTRILLI: All right.

22 ---Whereupon the hearing adjourned at 5:05 p.m., to be
23 reconvened on Tuesday, May 29th, 1990, commencing at
8:30 a.m.

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